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RAYNAUD'S DISEASE AMONG MEN

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It has been assumed that Raynaud's disease occurs very rarely among men as compared with its occurrence among women. From both a diagnostic and a prognostic standpoint it is important that the physician be able to recognize Raynaud's disease both among men and among women and to distinguish it from other peripheral vascular diseases, especially from those in which there occurs a secondary form of Raynaud's phenomenon. The differential diagnosis of Raynaud's disease is more difficult among men than among women because of the relative infrequency of Raynaud's disease among men in comparison with the organic peripheral vascular diseases which may produce similar vasospastic phenomena in the extremities.

In reviewing 200 cases of thromboangiitis obliterans, Allen and Brown [1] found that Raynaud's phenomenon was the first symptom in 12 per cent and that it occurred at some time during the course of the disease in 30 per cent of all cases. Barker and one of us,[2] studying a group of 280 patients suffering from arteriosclerosis obliterans, found that Raynaud's phenomenon occurred in 10 per cent of the cases.

By Raynaud's phenomenon is meant the occurrence of intermittent episodes due to a functional vascular disturbance either primary or secondary, resulting in color changes of the extremities, principally the fingers and toes and less frequently the nose and ears, initiated by exposure to cold and less frequently by emotional or nervous strain and stress. When the condition is primary, it may be referred to as Raynaud's disease.

Pathologic changes in Raynaud's disease are minimal regardless of the duration. In many cases there are few or no organic vascular changes. In some of the cases of more severe Raynaud's disease of long duration one is able to demonstrate intimal thickening of the smaller arteries, and there may be small cutaneous trophic lesions with small regions of local necrosis and localized scleroderma.

Although Raynaud [3] and later Hutchinson [4] attempted to clarify the confused state of functional peripheral vascular disturbances, it was not until Allen and Brown [5] published their work in 1932 that the clinical syndrome of Raynaud's disease was clearly elucidated. After making a thorough review of the literature and of 150 cases at the Mayo Clinic, Allen and Brown presented a working basis for diagnosing this condition. The following is a summary of the criteria which should be observed in making a diagnosis of Raynaud's disease: (1) episodes of Raynaud's phenomenon excited by cold or emotion; (2) bilaterality of Raynaud's phenomenon; (3) absence of gangrene, or, if present, its limitation to minimal grades of cutaneous gangrene; (4) absence of any primary disease which might be causal, such as occlusive arterial disease, cervical rib or organic disease of the nervous system; (5) symptoms of two years' or longer duration.

In the 150 cases in which the diagnosis was Raynaud's disease and which were studied by Allen and Brown [6] in 1932, 133 patients were female. The remaining 17 were male. Only 7 of the 17 cases in males met all the requirements of the criteria. In 10 cases the diagnosis of probable Raynaud's disease was made.

To our knowledge, a study of Raynaud's disease in a large group of men has not been made and no follow-up study for verification of the diagnosis has been made. It is our purpose in this paper to present such a study.

PRESENT STUDY

From January 1920 to December 1942 inclusive the diagnosis of Raynaud's disease, Raynaud's phenomenon or questionable Raynaud's disease was made for 847 patients coming to the Mayo Clinic. Because of the state of confusion in diagnosis prior to 1920, cases in which the diagnosis had been made previous to this time were omitted. Six hundred and forty-nine (77 per cent) of these patients were female. The remaining 198 (23 per cent) were male. The sex incidence of all patients entering the clinic during this period was about equal. It is of particular interest that the sex incidence for the group with a diagnosis of Raynaud's disease was likewise about equal from 1920 to 1924 inclusive. From 1925 on the incidence changed rather abruptly and has remained quite constant since, averaging approximately 21 per cent men and 79 per cent women. This change occurred at the time Brown, Allen, Barker, Horton and others of the Mayo Clinic became particularly interested in peripheral vascular diseases and about the time that Allen and Brown [7] began considering a

From the Division of Medicine, Mayo Clinic (Dr. Hines).

1. Allen, E. V., and Brown, G. E.: Thromboangiitis Obliterans: A Clinical Study of 200 Cases; I. Etiology, Pathology, Symptoms, Diagnosis, Ann. Int. Med. **1**: 535-545 (Feb.) 1928.

2. Hines, E. A., Jr., and Barker, N. W.: Arteriosclerosis Obliterans: A Clinical and Pathologic Study, Am. J. M. Sc. **200**: 717-730 (Dec.) 1940.

3. Raynaud, Maurice: On Local Asphyxia and Symmetrical Gangrene of the Extremities, in Selected Monographs, London, New Sydenham Society, 1888, pp. 1-199.

4. Hutchinson, J.: Raynaud's Phenomena, abstr., M. Press **72**: 403-405, 1901.

5. Allen, E. V., and Brown, G. E.: Raynaud's Disease: A Critical Review of Minimal Requisites for Diagnosis, Am. J. M. Sc. **183**: 187-200 (Feb.) 1932.

6. Allen, E. V., and Brown, G. E.: Raynaud's Disease Affecting Men, Ann. Int. Med. **5**: 1384-1386 (May) 1932.

7. Allen, E. V., and Brown, G. E.: Erroneous Diagnosis of Raynaud's Disease in Obliterative Vascular Disease (Thromboangiitis Obliterans): I. Vasomotor Disturbances Simulating Raynaud's Disease, Am. J. M. Sc. **174**: 319-329 (Sept.) 1927.

more logical approach for making the diagnosis of Raynaud's disease.

Seventeen of the 198 cases in males were discarded from our study for various reasons. The remaining 181 cases were then carefully reviewed and, by means of the Allen-Brown criteria, were classified into three groups. Those that seemed to meet all the requirements of the criteria were grouped as "diagnosis adequate." Those that met the criteria except for some questionable reason, as insufficient duration, unilateral-

TABLE 1.—*Raynaud's Disease Among 100 Male Patients*

Age on Onset *	Patients
Childhood (to 10 years)	6
11-20 years	10
21-30 years	24
31-40 years	33
41-50 years	18
51-60 years	8
61-65 years	1
Duration of symptoms †	
Less than 2 years	9
2- 5 years	32
6-10 years	25
11-15 years	10
16-20 years	13
21-50 years	11

* Youngest patient 5 years, oldest 63 years; 73 per cent 40 years or younger.
† Longest duration of symptoms fifty years.

ity of Raynaud's phenomenon, unrecorded or questionable peripheral pulsations or the possibility of the vasospasm being secondary to something else, were placed in the group designated as "diagnosis questionable" or probable Raynaud's disease. The third group consisted of cases in which, in our opinion, the diagnosis of Raynaud's disease should not have been made.

From the first two groups, in which the original diagnosis was thought either adequate or questionable, 100 cases were taken at random to make a general study of Raynaud's disease as it occurs among men. Cases and percentages will be used interchangeably because of the number chosen.

It was not surprising to find that in 73 per cent of this group the vasospastic symptoms had begun before the patient reached the age of 40 years (table 1) and that the greatest incidence of onset of symptoms occurred during the third and fourth decades. The youngest age of onset was given as 5 years and the oldest as 63 years. As many other writers have emphasized, Raynaud's disease is predominantly a disease of young adults.

In 91 per cent of this group, Raynaud's phenomenon had been present at least two years (table 1). Fifty-nine per cent of the patients had had their vasospastic symptoms for six years or more. Eleven per cent of them had had symptoms for twenty-one years or longer. The longest duration was given as fifty years.

Vasospastic changes occurred most frequently in the fingers. In 61 per cent of this group of patients the fingers, or less frequently the fingers and hands, alone were involved. Raynaud's phenomenon was recorded as being unilateral in 16 per cent of the cases. None of these 100 patients had vasospastic changes involving the feet alone, but in 36 per cent the hands and feet were both affected. In 3 instances color changes also occurred in the external ears, and in a single case the nose was involved. Vasospastic changes occurred in the remaining 5 per cent of the cases but the site of involvement was not recorded.

As mentioned previously, classically many writers describe a three phase color change in Raynaud's disease, the usual sequence being initial pallor, then cyanosis and finally rubor. In this group of 100 cases detailed color changes were recorded in 63. The typical three phase color change occurred in only 22 per cent of this group. In many of the remaining 37 cases, Raynaud's phenomenon was mentioned but not described in detail. Probably in many of these there were multiphasic color changes but it was not possible to evaluate them. Pallor was the most frequent color change described; it occurred as the sole phase in 41 per cent of the 63 cases.

The excitant mechanism producing this phenomenon was given as "cold" in every case, and only in 9 cases was emotional or nervous strain mentioned as an additional excitant. Apparently the latter is a more important factor among women than among men.

Some writers have emphasized the frequency of associated functional or neurotic disturbances among patients having Raynaud's disease. In 29 of this group of 100 cases such disturbances were important enough to be included in the final diagnosis. The majority were either functional gastrointestinal disturbances or functional disturbances of the nervous system.

In 3 cases there was a familial history of Raynaud's phenomenon similar to that of the patient. In all 3 cases the mother was the one affected.

Of this group of 100 patients follow-up information was obtained on 69 during subsequent visits to the clinic or from follow-up letters. From this information an attempt was made to evaluate the therapeutic regimen followed by these patients. In general, treatment recommended to them varied and depended on the severity of the symptoms and the degree of incapacitation. Usually the patient was reassured that massive gangrene of the involved extremities followed by one or more amputations was not going to develop, as was feared by so many. The primary objects of treatment were reassurance and an attempt to remove the exciting factors from the patient or the patient from the exciting factors. Protection from cold and sudden changes of temperature was advised in all cases. Warm clothing, including woolen socks, gloves and ear muffs, was recommended. Changes of occupation or climate were suggested to some patients when they seemed advisable. Smoking was usually discouraged. When the patient's condition was incapacitating enough to warrant it, or when the foregoing conservative measures had failed to give proper relief or were not practicable, sympathectomy was recommended.

Of the 69 patients from this group who were followed up adequately, sympathectomy had been performed on only 2, and definite improvement of both was reported. This form of treatment was recommended to many other patients but was refused. In the remaining 67, for whom more conservative treatment was used, the following interesting results were obtained: Thirty-three per cent of the patients reported improvement so as to have little or no incapacitation at the time when they reported; 44 per cent reported that their status had remained practically the same or that they were reasonably well. The remaining 23 per cent of this group reported their symptom complex as being

worse at the time of the follow-up than at the time of their last visit to the clinic. In summary, 77 per cent of these patients have enjoyed reasonably good health or at least have not become any worse following the conservative measures as outlined.

From a therapeutic standpoint an attempt was made to evaluate the effect of tobacco on these patients. Of the group of 69 patients 66 per cent were users of tobacco. Some patients improved considerably after reducing or stopping the use of tobacco. On the other hand, about as many improved while they continued smoking and in some instances improvement occurred even when the use of tobacco had been increased. A few patients who had continued smoking one to two packages of cigarets daily were among those reporting improvement of their Raynaud's disease. On the other hand, some who continued to smoke heavily became worse. The majority of the patients in all groups, whether nonsmokers, mild smokers or heavy smokers, followed a rather similar course. Consequently it is impossible from our studies to say that tobacco is or is not harmful to these patients.

The remaining portion of this study pertains to a follow-up study for the verification of the diagnosis of Raynaud's disease among men.

Of the total of 181 male patients who had had a diagnosis of Raynaud's disease on the original visit, follow-up information was obtained on 100. This information was secured either from follow-up letters or from records of subsequent visits. Again the number of cases and percentage can be used interchangeably.

The 100 cases were first divided into two main subgroups depending on the original diagnosis. In 58 cases the original diagnosis had been Raynaud's disease (no question) and in the remaining 42 the diagnosis had been questionable Raynaud's disease. The adequacy of the original diagnosis in each case was then evaluated, using the Allen-Brown criteria as a working basis. Finally, the follow-up information in each case was likewise analyzed and the diagnosis reevaluated using the same criteria.

TABLE 2.—*Original Diagnosis of Raynaud's Disease (No Question): 58 Cases*

Verification of Diagnosis (Allen-Brown Criteria)		Follow-Up Study	
Result	Cases	Result	Cases
Original diagnosis adequate	30	Follow-up diagnosis	30
		Diagnosis still adequate	26
		No Raynaud's phenomenon	2
		Now severe scleroderma	1
		Died	1
Original diagnosis should be questionable or probable Raynaud's disease	21	Follow-up diagnosis	21
		Diagnosis now adequate	16
		Raynaud's phenomenon still unilateral	2
		No Raynaud's phenomenon	2
		Died	1
Reason:			
Duration not recorded	10		
Insufficient time	6		
Raynaud's phenomenon unilateral	5		
Original diagnosis seemed incorrect	7	Follow-up diagnosis	7
		Some other disease now	4
		Occlusive arterial disease	2
		No Raynaud's phenomenon	1
Reason:			
Probably primary disease causing Raynaud's phenomenon	7		

Thirty of the 58 cases (table 2) in which the original diagnosis had been Raynaud's disease (no question) seemed to meet all the requirements for a certain diagnosis of Raynaud's disease. These were grouped as "diagnosis adequate." Follow-up information obtained two to many years after the original diagnosis revealed that 26 of the 30 (87 per cent) still met the requirements for an adequate diagnosis. The diagnosis in 4 cases now seems inadequate. Raynaud's phenomenon is now absent in 2 of the 4, and in another evidence of extensive scleroderma has since developed. One patient had died.

TABLE 3.—*Original Diagnosis of Questionable Raynaud's Disease: 42 Cases*

Verification of Diagnosis (Allen-Brown Criteria)		Follow-Up Study	
Result	Cases	Result	Cases
Original diagnosis seemed adequate	4	Diagnosis still adequate	4
Original diagnosis seemed questionable or probable Raynaud's disease	33	Follow-up diagnosis	33
		Diagnosis now seems adequate	13
Reason:		Diagnosis still questionable (e. g. arterial pulsations [?], unilateral Raynaud's phenomenon)	7
Insufficient duration	9	Acrosclerosis	5
Arterial pulse uncertain	8	Thromboangiitis obliterans	3
Duration not recorded	4	No Raynaud's phenomenon	3
Raynaud's phenomenon unilateral	4	Died	2
Early acrosclerosis (?)	4		
Raynaud's phenomenon secondary (?)	3		
Occlusive disease (?) in arteriogram	1		
Original diagnosis seemed incorrect	5	Follow-up diagnosis	5
		No Raynaud's phenomenon	4
Reason:		Occlusive arterial disease	1
No Raynaud's phenomenon	3		
Thromboangiitis obliterans	1		
Pneumatic hammer disease (?)	1		

The adequacy of the original diagnosis seemed questionable in 21 of the 58 cases. Sixteen of the 21 patients had had Raynaud's phenomenon for less than two years or the duration was not recorded. In the other 5 Raynaud's phenomenon was recorded as being unilateral.

Follow-up studies of this group of 21 cases revealed that in 16 (76 per cent) the diagnosis now seems adequate. In 2 cases Raynaud's phenomenon is still unilateral and therefore the diagnosis still remains questionable. The vasospastic changes have ceased to occur in 2 other cases. The remaining patient has died.

Seven of the 58 cases in which an original diagnosis of Raynaud's disease had been made failed to meet the Allen-Brown criteria and so were classified as "diagnosis inadequate or incorrect." Follow-up studies verified this impression. In 6 of these cases there is now some other disease with secondary Raynaud's phenomenon. In 1 case Raynaud's phenomenon no longer occurs.

The second large subgroup consists of 42 cases in which the original diagnosis had been questionable Raynaud's disease or probable Raynaud's disease (table 3). Again using the Allen-Brown criteria as a working basis, this group of cases was reviewed in the same manner as was the first group so that the adequacy of the original and subsequent diagnosis might be evaluated. In 4 of these cases all the requirements of the criteria were fulfilled. In our opinion a diagnosis of Raynaud's disease (no question) should have been made on the original visit. Follow-up studies verified this impression, as the diagnosis of unquestionable Raynaud's disease still seems adequate after two to many years in all 4 cases.

In our opinion, in 5 of this group of 42 cases the original diagnosis failed to meet the criteria for diagnosis of Raynaud's disease or of questionable Raynaud's disease and so we classified it as incorrect. Follow-up studies verified our impression. We agreed with the original diagnosis of questionable Raynaud's disease in 33 of the 42 cases. Thirteen of these 33 patients had had Raynaud's phenomenon less than two years or the duration was not recorded. The peripheral arterial pulsations were questionable or unrecorded in 8 cases. The vasospastic phenomenon was possibly secondary in 8 cases and it was unilateral in 4 other cases.

Follow-up studies of this group of 33 cases now reveal that 13 cases (39 per cent) fulfil the criteria and that a diagnosis of Raynaud's disease can now be made. The adequacy still remains questionable in 7. Progressing acrosclerosis is present in 5 other cases, while in 3 there is now evidence of thromboangiitis obliterans. The vasospastic changes have ceased to occur in 3 cases. Two patients have died.

COMMENT

One of the purposes of this study has been to gain a fuller knowledge of Raynaud's disease affecting men. In the past it has been difficult to make a diagnosis of Raynaud's disease among men without viewing that diagnosis with suspicion and feeling that some other pathologic entity, such as thromboangiitis obliterans, arteriosclerosis obliterans or scleroderma, which would explain the Raynaud phenomenon, would eventually develop. Our follow-up studies seem to prove that by following the criteria of Allen and Brown a diagnosis of Raynaud's disease can be made with confidence that some other form of peripheral vascular disease will not become apparent later. The only question regarding the criteria arising at this time is whether the phenomenon must be always bilateral. In 16 per cent of the 76 selected cases of questionable Raynaud's disease, Raynaud's phenomenon continued to be unilateral after two or more years without the development of any possible secondary cause for the phenomenon. Another interesting question that has arisen in our minds is how to interpret and incorporate the 7 cases in which Raynaud's phenomenon was occurring at the time of a previous visit but has since ceased. First of all we wonder if the patients had Raynaud's disease. Secondly, if they did, has the disease been cured or is the patient in a state of remission? Only time and further study can answer these questions.

The early establishment of a correct diagnosis of Raynaud's disease is of considerable importance to the patient. Raynaud's disease is usually a more benign disease than the more serious diseases which have Raynaud's phenomenon as a secondary manifestation, such as thromboangiitis obliterans, arteriosclerosis obliterans and scleroderma. If a diagnosis of Raynaud's disease can be made, the physician can give the patient assurance of a better prognosis than in most of the other conditions associated with secondary Raynaud's phenomenon and adequate treatment for Raynaud's disease can be instituted at an earlier date.

The treatment of Raynaud's disease depends on the degree of incapacitation. A conservative program of treatment is worth while when the disease is not too incapacitating. These measures are not curative but merely prophylactic. The patient is advised to avoid exposure to cold or changes of temperature. This may mean advising him to change his occupation or to move to a warmer climate. Protective clothing alone helps in many cases of mild Raynaud's disease. Although in the majority of instances tobacco apparently has no relationship either to the symptoms or to the course of the disease, a few patients are definitely benefited by abstinence. The new patient, if a user of tobacco, should at least give himself a fair trial of abstinence to determine if he is one who might be benefited.

Sympathectomy was done in 2 cases and recommended in others. Prompt relief followed in both cases so that there was much less incapacitation than before operation. Sympathectomy has been done with relief of vasospasm on many more women suffering from Raynaud's disease. Whenever the patient is considerably incapacitated and is unable to get relief from or follow the more conservative measures, sympathectomy should be considered.

SUMMARY

Of the 847 patients diagnosed as having Raynaud's disease or questionable Raynaud's disease at the Mayo Clinic between the years 1920 and 1942 inclusive, 198 were men. Seventeen of the latter group were discarded from our study. About 1925 the incidence of men to women changed definitely from an incidence of 50 per cent men and 50 per cent women to an incidence which has remained constant, 21 per cent men and 79 per cent women. Allen and Brown's criteria formulated about that time is a possible reason for this change.

A study of the nature and course of the disease was made on an unselected group of 100 of the 181 male patients. Follow-up studies were done on 69 of these patients. Sympathectomy had been performed on 2 of the 69, with improvement in both. In 33 per cent of the 67 cases in which more conservative treatment was used the condition had improved, in 44 per cent it was unchanged and in 23 per cent it was worse. The data on the effect of tobacco on Raynaud's disease are inconclusive.

An evaluation of the original diagnosis and a follow-up study were carried out in 100 of the 181 cases. Using the criteria of Allen and Brown,[5] the diagnosis on the original visit seemed adequate in 34, questionable in 54 and incorrect in 12. Of the 34 cases in which the diagnosis seemed adequate on the original examination, the follow-up study revealed that in 30 (88 per cent) the diagnosis was still adequate and evidence of any other disease which might have produced the symptoms secondarily had not developed. Of the 88 cases in which an original diagnosis of either Raynaud's disease or questionable Raynaud's disease had been made, the diagnosis of Raynaud's disease should be certified on the follow-up study in 59 cases (67 per cent). These data indicate that, if careful attention is given to the use of adequate criteria for the diagiosis of Raynaud's disease, this diagnosis can be made and verified on a follow-up study in a much greater number of cases than has previously been considered probable by most students of peripheral vascular diseases.

ETIOLOGY OF THROMBOANGIITIS OBLITERANS

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The etiology of thromboangiitis obliterans has been obscure ever since the first differentiation by Buerger between this condition and other forms of peripheral vascular disease. Impressed by the inflammatory type of lesions seen in the blood vessels, Buerger [1] regarded the disease as an infection, but all the clinical evidence indicates that this conception is incorrect. Goodman [2] agrees that thromboangiitis obliterans is an infectious disease and holds that an attenuated virus of typhus is responsible for it.[3] Kaunitz [4] suggests that chronic ergot poisoning from eating infected rye foods causes the disease, and recently Thompson [5] has claimed that fungous infection (dermatophytosis) is the causative agent. The occurrence of the disease in smokers has been commented on by several writers. Erb [6] in 1904 stated that smoking was an important contributing cause of this condition. Lilienthal [7] noted this relationship in 1914, and Willy Meyer [8] in 1920 expressed the conviction that thromboangiitis obliterans was due to the use of tobacco.

Thromboangiitis obliterans has interested me profoundly for twenty years, and during this time it has been my unusual opportunity to study in clinic and private practice over 1,400 cases of this disease. Hundreds of these cases have been followed for many years. Certain observations have emerged from this experience which have a bearing on the question of etiology.

The first of these is the incidence of the disease in the two sexes. In this series only 12 cases of thromboangiitis obliterans have been seen in women, an incidence of less than 1 per cent, while over 99 per cent have occurred in men. The infrequency of the disease in the female has been noted by other observers.[9] There is no known infection which affects almost exclusively one sex, and nothing known about the activities of micro-organisms or viruses warrants the belief that the female sex enjoys any special immunity. On this basis alone, theories that thromboangiitis obliterans are due to any form of infection fail to be convincing.

The second observation is that without exception all men and women with thromboangiitis obliterans have been smokers of tobacco. The statement appears frequently in medical literature that instances of this disease have been seen in nonsmokers. This is contrary to my experience. It is not difficult to explain this difference of opinion. It is easy to confuse peripheral vascular disease due to thromboangiitis obliterans with that due to presenile arteriosclerosis, an entirely different disease. This is particularly true in the age group between 40 and 55. In both conditions the symptoms, such as intermittent claudication, rest pain, coldness and numbness of the extremities, will be present. In both conditions the local signs, the absence of pulsations, the diminished oscillometric readings, the reduced temperature of the feet, the presence of ulcers or gangrene will be the same. A clinical differentiation rests on the recognition that when an individual shows signs of arteriosclerosis in other parts of his body the disease process in his legs is due to the same cause and is not due to thromboangiitis obliterans. Each patient should be carefully scanned from head to foot to elicit signs of arteriosclerosis. In table 1 there are listed the signs regarded as particularly significant. It should be emphasized that no one sign is looked on as decisive for differentiation. Rather each disease has a general pattern which usually makes distinction possible.

TABLE 1.—*Criteria for Differentiation Between Thromboangiitis Obliterans and Arteriosclerosis in Patients Between 40 and 50 Years of Age*

Thromboangiitis obliterans	Arteriosclerosis
Appears younger than his age	Appears older than his age
Hair normally pigmented	Hair usually gray
No arcus senilis	Arcus senilis frequently present
Retinal arteries normal	Retinal arteries usually sclerotic
Blood pressure usually low	Blood pressure often high
Radial and temporal vessels soft	Radial and temporal vessels thickened and hard
Upper extremities frequently involved	Upper extremities seldom involved
Femoral arteries frequently closed	Femoral arteries seldom closed
No calcification of vessels on x-ray examination	Calcification of vessels on x-ray examination frequently seen
Blood volume usually diminished	Blood volume usually normal
Symptoms of coronary artery sclerosis rare	Symptoms of coronary artery sclerosis frequent
Aorta appears normal on x-ray examination	Aorta sometimes appears elongated on x-ray examination
Albuminuria rare	Albuminuria not uncommon
History of migrating phlebitis frequent	History of migrating phlebitis rare

Care must also be used to exclude instances of peripheral arterial disease due to syphilis, embolism, trauma, polycythemia, poisoning from ergot or arteritis due to influenza, typhus or rheumatism. Thromboangiitis obilterans is a diagnosis made by exclusion, and there are no pathognomonic symptoms or signs by which it can be absolutely identified. Critical scrutiny of every case is necessary to establish the true nature of the disease. Those who carelessly report all cases of occlusive arterial disease in young people as thromboangiitis obliterans confuse medical literature and obscure the simple facts about this disease which are so clear and important.

The third point that is learned from the clinical experience with thromboangiitis obliterans is that the disease is almost uniformly progressive in individuals who continue smoking. In such patients early symptoms are soon followed by ulcers of the toes, gangrene and amputations of the extremity. The disease progresses from extremity to extremity, frequently causing the loss of one or both legs and occasionally one or both arms as well. In the group of 1,400 patients that

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1. Buerger, Leo: Is Thromboangiitis Obliterans an Infectious Disease? Surg., Gynec. & Obst. **19**: 582 (Nov.) 1914.
2. Goodman, Charles: Thromboangiitis and Rickettsia: Etiologic Relationship, J. Mount Sinai Hosp. **7**: 391, 1941.
3. "Colonel Harry Plotz, chief of the Division of Virus and Rickettsial Diseases, Army Medical School, Washington, D. C., has examined serum specimens from 16 cases of thromboangiitis obliterans for the presence of specific typhus antibodies. Epidemic antibodies were present in 4 cases, while none were found in the other 12 cases. The 4 individuals who showed the presence of epidemic antibodies immigrated from Poland and Russia, regions where epidemic typhus is prevalent. One patient gave a history of having had typhus previously, while the other 3 were not certain of a previous attack. The fact that 12 cases showed no evidence of typhus antibodies suggests that there is no relationship between typhus and thromboangiitis obliterans" (personal communication to the author).
4. Kaunitz, J.: Chronic Endemic Ergotism, Arch. Surg. **25**: 1135 (Dec.) 1932.
5. Thompson, K. W.: The Relationship of the Dermatomycoses to Certain Peripheral Vascular Infections, Internat. Clin. **2**: 156, 1941.
6. Erb: München. med. Wchnschr., 1904, no. 21.
7. Lilienthal, H.: Thromboangiitis Obliterans, Ann. Surg. **59**: 796, 1914.
8. Meyer, Willy: Further Contribution to Etiology of Thromboangiitis Obliterans, M. Rec. **97**: 425, 1920.
9. Horton, B. T., and Brown, G. E.: Thromboangiitis Obliterans Among Women, Arch. Int. Med. **50**: 884 (Dec.) 1932. Silbert, Samuel: Thromboangiitis Obliterans in Women, Ann. Surg. **101**: 324, 1935. Herrell, W. E., and Allen, E. V.: Thromboangiitis Obliterans in Women, Am. Heart J. **12**: 105, 1936. Van Dellen, T. R., and Wright, I. S.: Thromboangiitis Obliterans in Women, ibid. **13**: 373, 1937.

I have studied 174 have lost one leg, 100 both legs, 1 one leg and both arms, 2 both legs and one arm and 2 both legs and both arms.

The final fact that is evident from a study of patients with thromboangiitis obliterans is that the disease is immediately and completely arrested in individuals who permanently discontinue smoking. The disease process may be compared to a house on fire; with cessation of smoking the fire is extinguished. Damage has been done by the fire which must be repaired, but the house is no longer burning down. In support of this statement, the case histories of 100 patients with thromboangiitis obliterans, followed personally from ten to twenty years, is summarized in table 2. No patient is included whose age of onset of symptoms was over 45, who had a blood pressure of over 160 when trouble in the legs first developed, who showed calcification of the blood vessels on x-ray examination, whose Wassermann test was positive at any time or who suffered from rheumatic heart disease. All patients included had thromboses of major peripheral arteries in one or more extremities. This table includes all patients with thromboangiitis obliterans who have been followed over ten years and who have completely given up the use of tobacco. Eighty-three of these patients had no amputation when first seen, 15 already had one leg amputated and 2 had both legs off. It will be noted that in nearly all of the patients listed the onset of the peripheral vascular disease was between the ages of 20 and 40, the characteristic age of onset for patients with thromboangiitis obliterans. All of these patients were smokers; all of them stopped smoking throughout this period of observation. With few exceptions, all are well and working at various occupations, requiring no treatment. Ten illustrative cases will be cited in detail, but in one respect all of them are alike. In no instance

TABLE 2.—*Patients with Thromboangiitis Obliterans Followed Ten to Twenty Years*

Case	Patient	Age of Onset	Year of First Examination	Duration of Illness When First Seen	Symptoms *	Degree of Circulatory Impairment †	Local Lesions	Year of Last Examination	No. of Years Observed	Working	Occupation
						No Amputations					
1	M. S.	37	1923	2 yrs.	Pain	2+	Ulcer of toe	1943	20	Yes	Gelatin mixer
2	H. H.	38	1924	1 yr.	Pain	3+	Ulcer of toe	1944	20	Yes	Barber
3	I. K.	30	1924	3 yrs.	Intermittent claudication	2+	Ulcer of toe	1943	19	Yes	Cutter
4	H. L.	26	1924	5 yrs.	Pain	2+	Ulcer of toe	1943	19	Yes	Cutter or presser
5	S. K.	40	1925	6 yrs.	Pain	2+	Ulcer of toe	1943	18	Yes	Operator
6	S. J.	25	1925	1 yr.	Intermittent claudication	3+	Ulcer of toe	1943	18	Yes	Truck driver
7	J. M.	23	1926	3 yrs.	Pain, coldness	3+	None	1944	18	Yes	Garage mechanic
8	E. R.	24	1925	½ yr.	Pain	3+	None	1943	18	Yes	Insurance agent
9	J. L.	33	1926	1½ yrs.	I. C., rest pain	2+	None	1944	18	Yes	Operator
10	M. S.	37	1925	10 yrs.	Intermittent claudication	3+	None	1942	17	No	Brick layer
11	G. A.	28	1926	4 yrs.	Pain	2+	None	1943	17	Yes	Chauffeur
12	B. M.	44	1926	2 yrs.	I. C., (2 blocks), coldness, rest pain	3+	None	1943	17	Yes	Grocery clerk
13	N. R.	27	1927	14 yrs.	I. C. (3-4 blocks)	3+	None	1943	16	Yes	Hairdresser
14	I. K.	33	1927	2 yrs.	I. C. (¼ block), coldness	2+	None	1943	16	Yes	Musician
15	J. W.	31	1928	3 yrs.	I. C. (2 blocks), numbness	3+	None	1944	16	Yes	Salesman
16	J. S.	34	1928	2 yrs.	I. C. (1 block), coldness	3+	Small ulcer, left foot	1944	16	Yes	Storekeeper
17	A. G.	32	1928	10 yrs.	I. C. (2 blocks)	2+	None	1944	16	No	Butcher
18	J. W.	33	1927	2 yrs.	I. C., severe rest pain	3+	None	1943	16	Yes	Lumber business
19	V. N.	35	1927	1 yr.	I. C. (3 blocks), coldness	2+	None	1943	16	Yes	Market inspector
20	J. B.	39	1927	2 yrs.	I. C., rest pain, numbness	3+	None	1942	15	Yes	Tailor
21	H. M.	40	1926	1 yr.	Intermittent claudication	3+	None	1941	15	Yes	Storekeeper
22	J. R.	43	1926	3 yrs.	Intermittent claudication	3+	None	1941	15	Yes	Merchant
23	S. S.	40	1929	3 yrs.	Coldness, pain	2+	Ulcer, right big toe	1944	15	Yes	Finisher
24	L. W.	30	1929	5 yrs.	I. C. (3 blocks), rest pain	2+	Ulcer, right big toe	1944	15	Yes	Embroiderer
25	I. S.	40	1929	1 yr.	I. C. (few steps), coldness	2+	None	1943	14	Yes	Waiter
26	J. F.	25	1928	1 yr.	I. C., rest pain	1+	Ulcer, right 2d toe	1942	14	Yes	Clerk
27	S. N.	43	1926	1 yr.	I. C. (1 block), rest pain	3+	Ulcer, outer side left big toe	1940	14	Yes	Merchant
28	R. M.	31	1930	3 yrs.	Intermittent claudication	3+	Extensive ulcer, right foot, unhealed wound	1944	14	Yes	Farmer
29	D. B.	38	1929	½ yr.	I. C. (10 blocks), pain	2+	None	1943	14	Yes	Waiter
30	J. E.	35	1929	1 yr.	I. C., rest pain	3+	Ulcer (gangrenous), right 4th toe	1943	14	Yes	Milliner
31	H. L.	35	1930	¼ yr.	Pain	1+	Ulcer, left big toe, right 2d toe	1944	14	Yes	Bus driver
32	L. F.	42	1929	¾ yr.	I. C. (10 blocks)	1+	None	1943	14	Yes	Lawyer
33	L. A.	30	1930	7 yrs.	Pain	1+	Ulcer	1944	14	Yes	Operator
34	D. G.	22	1930	2 yrs.	I. C. (5 blocks), numbness	2+	None	1944	14	Yes	Shoe salesman
35	M. D.	37	1929	¼ yr.	I. C., rest pain	2+	Superficial ulcer, right 4th toe	1943	14	Yes	Plumber
36	A. H.	33	1930	2 yrs.	I. C., rest pain	2+	Ulcer, right 5th toe	1944	14	Yes	Collector
37	B. B.	20	1930	6 yrs.	Severe rest pain	3+	Ulcers (multiple) left foot	1943	13	Yes	Clerk
38	M. K.	38	1930	2 yrs.	Pain	3+	None	1943	13	Yes	Painter
39	H. R.	26	1930	3 yrs.	Pain	3+	None	1943	13	Yes	Foreman, shoe factory
40	S. P.	38	1930	4 yrs.	I. C. (4 blocks), rest pain	3+	Gangrene, left 2d toe; ulcers (multiple) left foot	1943	13	Yes	Storekeeper
41	D. L.	37	1928	½ yr.	Coldness, numbness, phlebitis	1+	None	1941	13	Yes	Letter carrier
42	B. M.	43	1928	4 yrs.	I. C. (1½ blocks)	3+	None	1941	13	Yes	Shoe machine operator
43	M. K.	41	1929	1 yr.	I. C. (3 blocks)	1+	None	1942	13	Yes	Doctor
44	M. K.	20	1931	2 yrs.	Rest pain, pain on walking	2+	Ulcer, left 5th toe	1944	13	Yes	Bus driver
45	R. L.	40	1930	1 yr.	I. C., numbness	2+	None	1943	13	Yes	Physical instructor
46	J. A.	44	1931	¼ yr.	I. C. (2 blocks), pain	2+	None	1944	13	Yes	Cutter
47	R. K.	23	1931	3 yrs.	Rest pain, coldness	2+	Ulcer	1944	13	Yes	Operator
48	J. R.	37	1931	3 yrs.	Pain, coldness	2+	Ulcer of foot	1944	13	Yes	Operator
49	H. K.	38	1930	1 yr.	I. C. (3 blocks)	3+	None	1943	13	Yes	Painter
50	G. S.	32	1931	5 wks.	I. C. (1 block)	3+	None	1944	13	Yes	Businessman
51	H. G.	23	1930	1 yr.	Intermittent claudication	1+	Healed ulcer	1943	13	Yes	Clerk
52	D. S.	36	1931	1 yr.	I. C., rest pain, coldness	2+	None; discoloration 2d toe right foot	1943	12	Yes	Salesman
53	P. D.	31	1930	1 yr.	I. C. (1 block), severe rest pain	2+	Gangrenous ulcers on both big toes and right 2d toe	1942	12	Yes	Stationery business
54	J. W.	22	1930	5 yrs.	I. C. (5 blocks), coldness, rest pain	2+	Gangrene, 2d and 4th left toes; ulcers, left 4th toe	1942	12	Yes	Furrier
55	P. S.	26	1929	2 yrs.	I. C., rest pain	...	None	1941	12	Yes	Operator
56	A. W.	38	1929	9 yrs.	I. C. (5 blocks), coldness	2+	None	1941	12	Yes	Furrier
57	I. G.	31	1928	12 yrs.	I. C. (2 blocks)	3+	None	1940	12	Yes	Furrier
58	C. P.	40	1932	8 yrs.	I. C. (1 block), severe rest pain	2+	Gangrene, 4 inner toes right foot; gangrene, both thumbs, right index finger	1944	12	Yes	Newspaper foreman
59	J. T.	22	1932	½ yr.	Pain	2+	None	1944	12	Yes	Postoffice clerk

TABLE 2.—*Patients with Thromboangiitis Obliterans Followed Ten to Twenty Years—Continued*

Case	Patient	Age of Onset	Year of First Examination	Duration of Illness When First Seen	Symptoms *	Degree of Circulatory Impairment †	Local Lesions	Year of Last Examination	No. of Years Observed	Working	Occupation
					No Amputations						
60	D. S.	26	1931	2 yrs.	I. C. (2 blocks), severe rest pain	3+	Shallow ulcer, dorsal surface, right foot	1943	12	Yes	Coal and oil business
61	S. R.	39	1931	3 yrs.	I. C., severe pain	2+	Gangrene, 2d, 4th and 5th toes; extensive infection; ulcer, inner side right big toe	1943	12	Yes	Merchant
62	M. W.	40	1931	3 yrs.	Coldness, I. C. (1 block)	1+	None	1943	12	Yes	Patrolman
63	D. W.	39	1931	½ yr.	I. C. (1 block), coldness	3+	Gangrene, left big toe, left 5th toe	1943	12	Yes	Furrier
64	J. H.	34	1931	1½ yrs.	Severe rest pain	2+	Extensive infected ulcer of foot	1943	12	Yes	Iron worker
65	I. K.	30	1932	15 yrs.	I. C. (2 blocks), coldness	4+	Ulcer	1943	11	Yes	Furrier
66	A. Z.	20	1932	2 yrs.	Pain in right toes; phlebitis	1+	None	1943	11	Yes	Businessman
67	I. B.	30	1931	1 yr.	I. C., numbness	2+	None	1942	11	Yes	Salesman
68	D. F.	25	1931	8 yrs.	I. C. (1 block)	3+	None	1942	11	Yes	Doctor
69	A. K.	33	1927	2 yrs.	I. C., rest pain	3+	Ulcer, dorsal surface right big toe	1938	11	Yes	Shoe machine operator
70	S. K.	24	1931	4 yrs.	I. C. (8 blocks), pain in big toes	2+	Ulcer, unhealed wound, right big toe	1942	11	Yes	Grocery clerk
71	J. G.	29	1932	½ yr.	I. C. (1½ blocks)	2+	None	1943	11	Yes	Salesman
72	I. S.	32	1932	10 yrs.	I. C. (2 blocks), rest pain	4+	None	1943	11	Yes	Manufacturer
73	L. H.	26	1930	2 yrs.	I. C., rest pain, phlebitis	1+	None	1941	11	Yes	Telephone mechanic
74	H. S.	35	1930	9 yrs.	I. C., coldness	2+	None	1941	11	Yes	Painter
75	I. S.	29	1930	8 yrs.	Inflammation of legs, phlebitis, numbness of toes, intermittent claudication	2+	None	1941	11	Yes	Jeweler
76	E. K.	40	1932	2 yrs.	I. C. (½ block)	3+	None	1943	11	Yes	Tailor
77	N. S.	35	1934	8 mos.	I. C. (4-5 blocks)	2+	None	1944	11	Yes	Musician
78	H. W.	24	1933	11 yrs.	Intermittent claudication	3+	None	1944	11	Yes	Operator
79	H. C.	32	1933	4 yrs.	I. C. (1 block), severe rest pain	4+	Unhealed wound, outer side right ankle	1943	10	Yes	Ticket agent
80	C. N.	34	1933	4 yrs.	I. C. (1½ blocks), coldness	1+	None	1943	10	Yes	Operator
81	B. H.	39	1931	3 yrs.	I. C. (½ block)	3+	None	1941	10	Yes	Business man
82	H. B.	44	1934	2 mos.	I. C., rest pain	3+	Gangrene, left 1st toe	1944	10	Yes	Elevator operator
83	I. G.	40	1934	8 mos.	I. C., rest pain	3+	Gangrene, right 1st toe	1944	10	Yes	Clerk
					One Amputation						
84	M. G.	27	1924	3 yrs.	Pain	1+	None	1944	20	No	
85	H. E.	38	1926	3 yrs.	Pain	3+	Ulcer	1943	17	Yes	Musician
86	D. L.	29	1926	4 yrs.	Pain, ulceration r. thumb	4+	Gangrenous ulcer, tip right thumb	1943	17	Yes	Dentist
87	A. S.	38	1926	13 yrs.	Coldness	2+	None	1943	17	No	
88	M. R.	27	1927	9 yrs.	Pain left hand	2+	Gangrene; ulcer, tip left index finger	1943	16	Yes	Machine operator
89	N. D.	28	1927	14 yrs.	I. C. (3 blocks)	3+	None	1943	16	Yes	Cashier
90	L. E.	28	1928	7 yrs.	I. C. (1 block)	2+	None	1943	15	No	
91	S. W.	30	1927	4 yrs.	Rest pain, ulcer left 2d toe	3+	Superficial ulcer, left 2d toe	1942	15	Yes	Barber
92	J. N.	36	1929	4 yrs.	Pain right big toe, I. C., rest pain	4+	Gangrene, inner side right big toe, tip of toe	1944	15	Yes	Confectionery store
93	E. M.	31	1929	1 yr.	Intermittent claudication	3+	Unhealed wound on stump	1943	14	Yes	Executive
94	I. B.	33	1928	15 yrs.	I. C. (1½ blocks), rest pain	3+	Ulcer, left shin, side of big toe and 3d toe	1942	14	Yes	Dress operator
95	M. H.	43	1929	½ yr.	Pain	2+	Ulcer	1943	14	Yes	Wood carver
96	F. S.	30	1930	7 yrs.	Pain left hand, severe rest pain	3+	Unhealed ulcer, 1st and 3d finger, right index finger	1943	13	Yes	Farmer
97	B. B.	27	1929	18 yrs.	I. C. (1 block), cramps in hands	3+	None	1940	12	No	
98	S. H.	31	1930	3 yrs.	I. C., rest pain	3+	Small ulcer, outer side left foot; ulcer, stump right leg	1940	10	Yes	Baker
					Two Amputations						
99	C. H.	22	1927	19 yrs.	Pain right wrist, coldness	3+	None	1944	17	Yes	Executive
100	P. K.	27	1929	19 yrs.	Pain in hand	3+	None	1941	12	Yes	Business man

* I. C., intermittent claudication.

† Explanation of degree of circulatory impairment: 4+, femoral, popliteal, anterior tibial and posterior tibial arteries closed; 3+, femoral open, popliteal, anterior tibial and posterior tibial arteries closed; 2+, femoral and popliteal open, anterior tibial and posterior tibial arteries closed; 1+, femoral, popliteal and one foot pulse open, one foot pulse closed.

has there been any progression of the vascular disease since the use of tobacco was stopped, and not 1 patient in this group required an amputation. What is true of this 100 cases is also true of several hundred other patients with thromboangiitis obliterans followed less than ten years.

No measures of any kind to combat infection were used in this group of patients. None were prohibited from eating rye bread or using rye whisky, nor were there any other restrictions of diet. A few of them showed signs of epidermophytosis between the toes. Thus, if any of the foregoing factors were responsible for the disease, progression should have taken place. Surely, it cannot be a coincidence that in not 1 of the 100 cases studied was any progression observed. This fact should be contrasted to the uniform progression of the disease in patients who continue smoking.

The evidence is convincing that the use of tobacco is the sole factor constantly associated with the occurrence and the progression of thromboangiitis obliterans. However, it is also clear that millions of men and women smoke incessantly without developing this disease. Why is it that a practice which so many indulge with impunity is so harmful to a few? Certainly a constitutional factor, a special sensitivity of the blood vessels to the effects of tobacco, must also be present. Only those who have such a constitutional factor will develop thromboangiitis obliterans from smoking.

The rarity of thromboangiitis obliterans in the female sex indicates that women either have a biologic protection against the effects of tobacco or fail to inherit the constitutional factor necessary to make them susceptible. That a biologic protection is present appears unlikely. The 12 women in my series who presented typical instances of thromboangiitis obliterans differed in no apparent way from other members of the female sex. Whatever biologic protection other women have against the effects of tobacco should also have been present in

these 12 individuals. It is tempting to regard thromboangiitis obliterans as a sex linked disease, similar to hemophilia and color blindness. In such conditions the disease is transmitted through the female as a recessive trait and appears only in the male. Under the rare conditions in which the father has the disease and the mother carries it as a recessive trait, the daughter may show the condition. Unfortunately, in no instance have I been able to demonstrate such an occurrence in the parents of the female patients with thromboangiitis obliterans. For the present it must remain only a surmise that the constitutional factor which is responsible for thromboangiitis obliterans is inherited along sex linked lines.

TEN CASE HISTORIES

CASE 1.—J. W., an upholsterer, was first seen in December 1929, at which time he was 26 years old. He gave a history of intermittent claudication in the left leg for five years. Four months previously he had developed gangrene of the left second and fourth toes. He began to smoke at the age of 15, averaging about twenty cigarets a day. The patient was well nourished. The general physical examination was negative. The circulation in the upper extremities was normal. Both femoral and both popliteal pulsations were present. The right anterior tibial and dorsalis pedis pulses were present. The right posterior tibial pulse was absent. There was no pulsation in the left foot. The left foot showed pronounced rubor and was very cold. There was gangrene of the left second and fourth toes. The oscillometer readings were right calf 4, right ankle 1½, left calf ½, left ankle 0. He stopped smoking and was treated with intravenous injections of 5 per cent saline solution. The gangrenous lesions separated, leaving ulcers on the toes. By May 1930 the ulcers were healed and he was able to walk five blocks without stopping. In November 1930 he could walk ten blocks and he returned to work. At that time the pulsations in the foot were the same as previously noted. The oscillometer readings were greatly improved. They were right calf 9½, right ankle 4, left calf 3½, left ankle faint. Treatment was discontinued at this time. The patient has remained in good condition and has been working regularly during the past twelve years. He has had no recurrence of circulatory trouble in the legs. He was last examined in August 1942. At this time the right anterior tibial and dorsalis pedis pulsations were present as before. No other pulse was present in either foot. The oscillometer readings were right ankle 2½, left ankle ½.

CASE 2.—D. P., a merchant, was first seen in April 1930, at which time he was 32 years old. He gave a history of migrating phlebitis of both legs for one year. For three months he had ulcers on both great toes and the right second toe. He began to smoke at the age of 15, smoking about twenty cigarets a day. He was well nourished. The general physical examination was negative. The circulation in the upper extremities was normal. Both femoral and both popliteal pulses were present. All normal pulsations were absent in both feet. On the outer side of the left ankle there was a peroneal pulsation. There were two gangrenous ulcers on the left great toe, each of which measured 2 cm. in diameter. There was a gangrenous ulcer of the same size on the right great toe and a smaller ulcer on the right second toe. The oscillometer readings were right calf 4½, right ankle ¼, left calf 5½, left ankle 2½. The patient was treated with cessation of smoking, bed rest and injections of 5 per cent sodium chloride solution. His condition improved steadily. By January 1931 all ulcers were completely healed, he was able to walk three blocks without discomfort and he had returned to work. Saline injections were continued until October 1932. At this time good pulsations were present on the outer side of both ankles. The oscillometer readings were right ankle 1½, left ankle 2½. Treatment was discontinued at that time because the circulation was regarded as satisfactory and the patient had no symptoms. He has received no treatment since then. He has continued at his work without interruption for the past ten years. He was last examined in August 1942. At this time the left posterior tibial and left dorsalis pedis pulses had returned. Both peroneal pulsations were present as before. The oscillometer readings were right ankle 1½, left ankle 3.

CASE 3.—E. R., an insurance agent, was first seen in the outpatient department of the Mount Sinai Hospital in November 1924, at which time he was 23 years old. He gave a history of intermittent claudication in both legs for three months. For ten weeks he had had severe pain in the right foot, which had made it impossible for him to work. There was no ulceration. He was well nourished. The general physical examination was negative. The left radial and right ulnar pulses were absent. The right radial and the left ulnar pulses were present. Both femoral and the left popliteal arteries were open. The right popliteal artery was closed. The left posterior tibial pulse was present. The left anterior tibial and dorsalis pedis were absent. There was no pulse in the right foot. He stopped smoking and received injections of hypertonic saline solution, at first three times a week and later less frequently. Treatment was continued for about a year. He has had no treatment since the end of 1925. He has remained in excellent condition and has had no further trouble with his feet. He is able to do his work as a life insurance agent, which requires him to climb stairs a good deal during the day. He was last examined in May 1943. He reported that he walks a mile easily and is still working as an insurance salesman. Examination showed the right radial pulse open; the right ulnar pulse was closed; the left radial pulse was closed; the left ulnar pulse was open; good posterior tibial pulses were present in both legs. The oscillometer readings were right calf 3½, right ankle 1¼, left calf 5, left ankle 2½.

CASE 4.—J. M., a garage mechanic, was first seen in February 1926, at which time he was 26 years old. He gave a history of migrating phlebitis in both legs for two years. For eight months there had been severe pain in the left ankle, and he walked with a decided limp. He smoked twelve cigarets a day. He was well nourished. The general physical examination was negative. The circulation in the left upper extremity was normal. The right radial was closed, the right ulnar was open. Both femoral and the right popliteal arteries were open. The left popliteal artery was closed. The right posterior tibial pulse was good. There was no other pulse in the right foot and no pulse in the left foot. The left foot was extremely cold and deeply cyanotic. There were no ulcers. The oscillometer readings were right calf 8, right ankle 5, left calf 1½, left ankle very faint. He stopped smoking and was treated with intravenous injections of hypertonic salt solution from February 1926 to February 1928. The symptoms cleared up completely and he returned to work and has continued to work ever since. There has been no recurrence of trouble with his legs. He was last examined in January 1944. At this examination all pulses were present in the right foot. There was a small left posterior tibial pulse. There was no other pulse in the left foot. Both feet were warm and normal in color. The oscillometer readings were right ankle 4, left ankle 1¼.

CASE 5.—J. S., a painter, was first seen in October 1928, at which time he was 36 years old. He gave a history of pain and coldness in the left leg for two years. He had intermittent claudication after walking one block. He smoked ten cigarets a day. He was well nourished. The general physical examination was negative. The left ulnar pulse was absent. All other pulses were present in the upper extremities. Both femoral and the right popliteal arteries were open. The left popliteal artery was closed. There was no pulse in either foot. The left foot presented typical glossy redness in the dependent position. The oscillometer readings were right calf 1½, right ankle very faint, left calf very faint, left ankle zero. He stopped smoking and was treated with injections of hypertonic salt solution twice a week until October 1930. At this time he was able to walk ten blocks easily without pain. Both

feet were warm. He returned to his work as a painter and has been working regularly since then. He has been examined periodically. He was last examined in April 1943. At this time he reported that he had no symptoms in his legs. Both popliteal arteries were now open but there was still no pulse in either foot. However, the oscillometer readings had shown considerable improvement and were now right calf 4, right ankle 1½, left calf 3, left ankle 1.

CASE 6.—M. G. was first seen in January 1922, at which time he was 28 years old. He had severe pain in his left foot for six weeks and during this time he had an extensive ulcer on the left first toe. He smoked fifteen cigarets daily and continued to do so. In spite of conservative treatment gangrene of the left lower extremity developed and a left midthigh amputation was done at the Mount Sinai Hospital in 1924. The stump healed by primary union. At this time he stopped smoking. He was well nourished. The general physical examination was negative. The left lower extremity was amputated through the midthigh. The right femoral and popliteal arteries were open. The right posterior tibial pulse was good. The right anterior tibial and dorsalis pedis pulses were absent. There was a good pulse on the outer side of the right ankle. The oscillometer reading was right ankle 5. The patient was told to refrain from smoking. He has been given no treatment and has been examined every year since 1924. On his last examination in June 1944 he was in excellent general health. The right posterior tibial and peroneal pulsations were present as they had been throughout the twenty years of observation. The oscillometer reading was right ankle 5. There was no evidence of any progression in the patient's condition.

CASE 7.—J. E., a millinery operator, was first seen in June 1929, when he was 36 years old. He gave a history of severe pain in the right foot, and for four weeks gangrene had been present on the right first toe. He smoked fifteen cigarets a day. He was well nourished. The general physical examination was negative. The circulation in the upper extremities was normal. Both femoral and the left popliteal arteries were open. The right popliteal artery was closed. All pulsations were present in the left foot. There was no pulsation in the right foot. There was an area of gangrene 1 cm. in diameter on the base of the right great toe. There was a gangrenous ulcer 2 cm. in diameter on the outer side of the right fourth toe. The oscillometer readings were right calf very faint, right ankle 0, left calf 6, left ankle 3. The patient stopped smoking. He was treated with intravenous injections of hypertonic salt solution until early in 1932. His condition improved strikingly. His foot healed and he was able to walk twenty blocks without stopping. He has continued to be examined periodically, the last time in June 1943. At this time all pulses were present in the left foot. There was no pulse in the right foot. The oscillometer readings were right calf 2, right ankle ½, left ankle 3½. He had remained in excellent condition throughout the eleven years since treatment was stopped.

CASE 8.—H. K., a painter, was first seen in the outpatient department of the Mount Sinai Hospital in July 1930, at which time he was 38 years old. He gave a history of intermittent claudication in the left leg for eight months. He was unable to walk more than three blocks without stopping. There was no history of migrating phlebitis or ulcerations of the toes. He smoked about twenty cigarets a day. He was well nourished. The general physical examination was negative. All pulsations were present at both wrists. The right femoral and popliteal arteries were open; the left femoral and popliteal arteries were closed. All normal pulsations were present in the right foot. There was no pulsation in the left foot. The oscillometer readings were right calf 3½, right ankle 1½, left calf ¼, left ankle 0. He stopped smoking and was treated for one year with saline injections. He has had no treatment since then. When last examined in May 1943 he was in good condition, working as a painter, and not smoking. He was able to walk fifteen blocks without stopping. All pulses could be felt in both feet. The oscillometer readings were right calf 10, right ankle 3¼, left calf 2½, left ankle 1¼.

CASE 9.—D. S., a merchant aged 28, was first seen in July 1930. Intermittent claudication had been present in both legs for two years, and for seven weeks he had a painful ulcer on the right foot. He was smoking twenty cigarets daily. He was well nourished. The general physical examination was negative. The circulation in the upper extremities was normal. Both femoral pulsations were small, both popliteals absent. There was no pulse in either foot. The right foot was cold and red, and on the dorsal surface there was a necrotic ulcer 3 by 4 cm. in diameter. The oscillometer readings were left calf faint, left ankle 0, right calf faint, right ankle very faint. The patient stopped smoking and was treated with intravenous injections of 5 per cent sodium chloride solution. In February 1931 the ulcer was healed and he could walk four blocks slowly without pain. Treatment was stopped in August 1932. He has been examined regularly every year since then. He has continued in excellent health, without recurrence of symptoms. He has been working regularly. When last examined, in August 1943, there was no pulse in either foot. The oscillometer readings were both calves 2½, both ankles ¾.

CASE 10.—L. B., a salesman, was first seen in April 1931, at which time he was 31 years old. He gave a history of intermittent claudication in both legs for one year. He smoked twenty cigarets a day. He was well nourished. The general physical examination was negative. The circulation in the upper extremities was normal. Both femoral and both popliteal arteries were open. The right anterior tibial and dorsalis pedis pulsations were present. There was a good pulse on the outer side of the right ankle. The right posterior tibial pulse was absent. There was no pulse in the left foot. The left foot presented typical rubor in the dependent position. The oscillometer readings were right ankle 2, left ankle 2. He stopped smoking and was treated with saline injections with diminishing frequency for a year. At this time he was able to walk ten blocks without any pain, and he returned to work. He has been examined periodically, the last time in July 1942. At this time he had no symptoms in his legs. All pulses were present in the right foot. The left anterior tibial pulse was present. There was no other pulse in the left foot. The oscillometer readings were right ankle 3, left ankle 2½. He had never had any recurrence of symptoms.

SUMMARY AND CONCLUSIONS

One hundred patients with thromboangiitis obliterans have been personally followed more than ten years. All these patients stopped smoking at the beginning of treatment and have not resumed since.

In all of them the disease has remained completely arrested following the initial period of treatment.

Thromboangiitis obliterans is caused by smoking in individuals constitutionally sensitive to tobacco.

1126 Park Avenue.

Discovery of Oxygen.—No one could have been more surprised, he tells us here himself, than the large hearted, liberal minded, nonconformist English clergyman Joseph Priestley, whose curiosity actually brought him credit for the discovery of oxygen on Aug. 1, 1774. Always a stubborn believer in the false "phlogiston" theory (which held that heat was a ponderable substance), Priestley called his new gas "dephlogisticated air"; Lavoisier gave it the name "oxygen" and made it a foundation stone of modern chemistry. These early chemists, understandably enough, found difficulty in distinguishing between surprisingly different kinds of new "airs" and "gases." "Empyreal air" was the name given to oxygen by Carl Wilhelm Scheele (1742-1786), a poor Swedish apothecary, discoverer of chlorine, glycerin, barium, ammonia and numerous organic acids, whose posthumous notes reveal that he had prepared oxygen before Priestley.—The Autobiography of Science, edited by Forest Ray Moulton and Justus J. Schifferes, New York, Doubleday, Doran & Co., Inc., 1945.

OUTBREAK OF FOOD POISONING DUE TO SALMONELLA MONTEVIDEO IN AN ARMY GENERAL HOSPITAL

VARIED CLINICAL MANIFESTATIONS AND DEMONSTRATION OF SALMONELLA AND HETEROPHILE AGGLUTININS

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This is a report of an outbreak of food poisoning due to Salmonella montevideo affecting both the organizational personnel and the patient population of an army general hospital. The clinical features were varied, and isoagglutinins and heteroagglutinins were demonstrated in the blood of infected persons.

The first cases appeared during the night of April 11-12, 1944 with manifestations of an acute, prostrating gastrointestinal disturbance. Within twenty-four hours 267 persons had the ailment. In the next twenty-four hours 70 more cases appeared, and in the third twenty-four hour period an additional 13 cases developed. In all 350 persons were afflicted, and of these 303 were patients. Of the remainder, 45 were enlisted corpsmen and 2 were nurses of the hospital staff. It was found that, of the three hospital messes (officers', enlisted men's and patients') only the patients' mess was implicated. Of the 350 individuals affected 346 had eaten food from that mess, and 3 of the remaining 4 had had contact with food from the patients' mess in serving it or cleaning plates that had contained it. In 1, connection with the patients' mess could not be established.

Food served at supper of April 11 was responsible for the outbreak. All preceding meals could be excluded by virtue of the fact that 39 patients had been transferred to another hospital after lunch of that day, none of whom became sick. Unfortunately, samples of food eaten at the supper meal were unavailable the next morning. This precluded a direct bacteriologic study of the food consumed. However, analysis of the dietary histories of the affected persons permitted the conclusion that at least one of three pans of rice pudding had been the immediate infected source. Preparation of the pudding had been completed by 4 a. m. of April 11. It had then been left in flat field-range pans at kitchen temperature until served that afternoon at 4 o'clock and later. There had been twelve hours or more opportunity for contamination and incubation. Further consideration as to the possible ultimate source of infection is given later.

CLINICAL FEATURES OF OUTBREAK

The extremes of calculated incubation time from the offending meal to the onset of symptoms was from three to sixty-six hours, and more than half began within fifteen hours or less. The onset was abrupt, with abdominal cramps and watery diarrhea. There were two to twenty liquid evacuations in the first twenty-four hours. Nausea and vomiting were usual, and toxic manifestations in the form of headache, fever, chilliness or chills, generalized aches and pains (particularly of the lumbar region), rapid pulse and a flushed, prostrated appearance were the rule. The abdomen was diffusely tender. Fifty-six patients (about 15 per cent) had herpes febrilis, and this was sometimes pronounced and extensive. The average duration of acute symptoms was three to six days, with fever ranging from 102 to 104 F. In a few cases the temperature went above 105 F. The diarrhea lasted three to five days usually but in some cases persisted to a mild degree for as long as a week or more. Almost all of the duty personnel affected had to be hospitalized.

An interesting feature of the outbreak was the occurrence of 19 cases (about 6 per cent) with bronchopulmonary involvement. Of these, 14 showed roentgenographic pulmonary changes interpreted as interstitial pneumonia, 4 had evidence of acute bronchitis and 1 had a frank bronchopneumonic process with bloody sputum which was positive for Salmonella on several examinations. In most of the cases with pneumonia the initial acute gastrointestinal phase of the sickness was followed by a period of several days during which the temperature was normal or almost normal. The temperature then rose again, accompanied by complaints of cough, expectoration and chest pain. Physical findings over the chest were usually minimal. Within a week the temperature returned to normal and x-ray evidence of resolution set in.

A number of patients, after the early acute febrile episode, settled down to a week or more of low grade fever. Some of these had evidence of bronchitis, but in others there was no apparent pulmonary complication. Only 1 developed a palpable spleen, and none had rose spots. In contrast to the early mild polymorphonuclear leukocytosis of the acute phase, at this time these patients showed leukopenia with relative lymphocytosis. Another feature of this group was a rather persistent asthenia and a "washed out" appearance, with fleeting aches and pains.

Two patients had bacteremia with blood culture positive for Salmonella. Both had evidence of interstitial pneumonia during their course, which tended to be low grade and prolonged. No suppurative foci developed.

One patient, who also had bacteremia, had urticaria about the knees and left elbow which came on ten days after onset and lasted two days. At the height of his bronchopneumonic process the patient with Salmonella bronchopneumonia developed three small subcutaneous nodules on the anterior aspect of the left thigh and one on the volar aspect of the right forearm. The former disappeared in a day, but a month later the one on the right forearm was still present. It was 2 to 3 mm. in size, attached to fascia but not to the overlying skin and only slightly tender; the skin was not discolored.

Several patients complained of sharp occipital and cervical pains radiating to the shoulder girdle. Two had similar type pains involving the trunk. These pains, which were interpreted as neuritic or radicular in nature, came on within a few days of onset of the illness and lasted up to a week.

In the entire group of 350 cases there were no deaths, and clinical recovery, although somewhat prolonged in some, was nevertheless complete.

The authors are assistant clinical professor, associate and assistant respectively in the Department of Internal Medicine, Long Island College of Medicine, Brooklyn, on leave of absence.

Lieut. Col. M. L. Rakieten and his staff performed the laboratory work and prepared the bacteriophage. Final identification of the organism concerned as S. montevideo was reported by the First Medical General Laboratory. Professional officers of the medical and surgical services assisted in the accumulation of data. Capt. Paolo Revenna gave aid during the outbreak. Capt. Peter J. Gianquinto made the x-ray interpretations.

LABORATORY FINDINGS

Stool cultures could not be made on all patients. However, in over 100 cases initial stool culture was found positive for a nonlactose fermenter belonging to the Paratyphosus C group of Salmonella. The organism was found to agglutinate with Salmonella cholerae suis antiserum and was later more specifically identified as S. montevideo. Two patients had the same organism in the blood and 1 in the sputum, as already noted. Urine cultures on several patients were negative. In order to determine whether significant cross infection was occurring, stool cultures were made on a series of patients who had not fallen ill. All were negative. Further, stool cultures were also made on unaffected mess personnel to exclude any subclinical cases or carriers. These too were entirely negative.

Military requirements, necessitating early return to duty, made it impossible to carry out serial stool cultures on a great number of those afflicted. This had to be confined almost exclusively to organization personnel, particularly since these were almost all food handlers. In 28 of these, serial study was uninterrupted and it was possible to note when the stool cultures turned negative. In these 28, stool cultures remained positive for from two to seven weeks after onset of the disturbance, 21 for four weeks or more. By the end of the seventh week all had become negative. It was not at all unusual for one or even two weekly cultures to be negative with a return then to positive. With 2 exceptions all were permitted to return to food handling after three or more weekly stool cultures in succession had been negative. One man, a cook, suspected of a possible chronic carrier state (even though he met the aforementioned criteria), was permanently excluded from food handling. His role as a possible source is considered later.

During the first week of the outbreak, tests were made for the presence of serum Salmonella agglutinins in 25 cases. With 1 exception all were completely negative. This man, with serum Salmonella agglutins in a dilution of 1 : 320, was suspected of being a carrier, as noted later. Subsequent Salmonella agglutination tests were carried out in a number of these cases as well as others not tested in the first week. In from three to six weeks Salmonella agglutinin titers ranging from 1 : 50 to 1 : 800 were found. Subsequent to the sixth week the titers decreased. A number of individuals not affected with the illness were also tested and showed no agglutinins. It was also interesting to find that some patients developed agglutinins for sheep's red blood cells in titers ranging from 1 : 64 to 1 : 512. These too showed a rise within the first few weeks, followed by a decrease in strength. However, there was no consistent parallelism in the development or subsidence of Salmonella and heterophile agglutinins, nor was any clear correlation with clinical course evident.

TREATMENT

Symptomatic treatment of these patients consisted in complete bed rest, liquid diet and the administration of antidiarrheal medication such as bismuth and paregoric. When dehydration and toxicity were severe, intravenous infusions of glucose in saline solution were given. A few were given castor oil at the onset of the trouble but it had no effect in aborting the process. More than half of the patients were given full doses of sulfaguanidine during the early stages of the illness. There was no appreciable benefit, either in clinical course or in rendering the stools negative more quickly, as compared with those receiving no sulfonamide therapy. Sulfadiazine was also given to a group of patients in an attempt to turn stool cultures negative more quickly. It was entirely ineffective. In a few cases bacteriophage was given. Its value could not be assessed, although in 2 cases its administration was followed by an immediate change from persistently positive to negative stool cultures.

ULTIMATE SOURCE OF INFECTION

The cook who prepared the rice pudding was closely questioned and gave a history of two to four loose stools daily since 1929. A routine stool culture on him a month prior to the outbreak had been negative. He came down with a perfectly typical attack of food poisoning after an eight hour incubation period. Yet during the first week of illness (April 17) his serum was positive for Salmonella agglutinins in a dilution of 1 : 320 at the same time that Salmonella agglutination tests on 24 other individuals were entirely negative. At the same time he showed a heterophile agglutinin titer of 1 : 128. His isoagglutinins and heteroagglutinins rose to 1 : 400 and 1 : 256 respectively and then fell to 1 : 200 and 1 : 32. It is entirely possible, then, that this man was a chronic carrier and transmitted infection to one portion of the pudding directly or to the pan in which it was put. His carrier state, if present, was apparently not accompanied by appreciable immunity to the infection. Subsequent more thorough clinical and x-ray study resulted in a diagnosis of spastic colon. Six stool cultures were persistently positive between April 14 and May 20 in spite of two courses of sulfaguanidine (54 Gm. from April 13 to 17 and 60 Gm. from April 20 to 24). On May 23 and 24 he was given a total of 12 cc. of bacteriophage orally. This was followed by four negative stool cultures from May 31 to June 16. Nevertheless, as noted previously, he was entirely excluded from food handling.

Various foods, including the ingredients used in making the rice pudding, were cultured, unfortunately not from the same lots used in making the offending food, for none was available. Powdered and evaporated milk, sugar, egg powder, raisins, bread, water, meat, all were negative. It is not likely, however, that an original contamination of ingredients was the source of trouble, for sufficient heat was used in the making of the pudding to kill effectively any enteric organisms. It seems much more reasonable that inoculation of the food occurred in the twelve hour period during which it was kept in pans at kitchen temperature. Contamination by rodents was not considered probable. This could hardly have occurred after the preparation of the pudding in view of the continuous activity of personnel in the kitchen. An original pollution of ingredients, such as is possible in any storeroom, would probably have been eliminated in the process of cooking, as already noted.

SUMMARY AND CONCLUSIONS

1. An outbreak of food poisoning due to Salmonella montevideo affected 350 individuals of the patient population and organizational personnel of an army general hospital.

2. The clinical manifestations included pronounced gastrointestinal upset, severe prostration and toxicity, high fever, herpes (15 per cent), bacteremia (2 cases), neuritis and bronchopulmonary involvement (6 per cent). Of the 19 cases with bronchopulmonary involvement, 14 had interstitial pneumonia, 4 bronchitis and 1 a frank Salmonella bronchopneumonia with positive

sputum. Two patients had skin manifestations (urticaria and subcutaneous nodules), and a number of cases showed a postacute phase characterized by low grade fever, asthenia, fleeting aches and pains, and leukopenia with relative lymphocytosis. There were no deaths, and no cross infection occurred.

3. The infection gave rise to both isoagglutinins and heteroagglutinins. These did not necessarily parallel each other nor was there any clear correlation between the development of agglutinins and the clinical course. Salmoneliosis may thus be one cause of a positive heterophile agglutination test.

4. Full doses of sulfaguanidine were entirely without effect either in ameliorating the clinical condition or in rendering the stool cultures negative. Sulfadiazine was also unsuccessful in converting positive stool cultures. Bacteriophage was tried in only a few cases and was successful in 2.

5. In a group followed with weekly stool cultures none were positive for more than seven weeks whether treated or untreated. Intermittent stool negativity was not unusual.

6. The immediate source of infection was rice pudding allowed to stand at kitchen temperature for twelve hours or more. The evidence suggests that the cook who prepared the pudding may have been a chronic carrier.

HEPATIC DAMAGE IN INFANTILE PELLAGRA

AND ITS RESPONSE TO VITAMIN, LIVER AND DRIED STOMACH THERAPY AS DETERMINED BY REPEATED LIVER BIOPSIES

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During the last three years nearly 300 children suffering from acute malnutrition have been admitted to the Non-European Hospital, Johannesburg. More than 60 per cent of these infants manifested the clinical signs of pellagra.

In our experience vitamin therapy has not only failed to save the lives of more than 50 per cent of these children but in many instances we strongly suspected that it aggravated the disease and even hastened death.[1] Trowell,[2] prominent worker in this field, has also recorded the unresponsiveness of this disease to vitamin therapy, including nicotinic acid. In these circumstances, therefore, it was essential to seek some other method of saving the lives of children suffering from severe malnutrition.

Recent experimental work has revealed that in animals the liver is severely damaged by deficiencies or excesses of vitamins[3] by diets containing low concentrations of proteins,[4] by the presence or absence of certain amino acids[5] or by a combination of these imbalances in the diet. However, Himsworth and Glynn[6] have stated that there is no positive evidence that the liver in man is affected to any extent or in the same manner by dietary imbalances as has been shown to be the case in laboratory animals. Moreover, György in a recent review[7] cautions against the premature application of these experimental findings to clinical medicine.

Sydenstricker and his collaborators[8] have repeatedly suggested that the liver may be implicated in some way in the pathogenesis of pellagra. However, apart from the findings by investigators of some disturbances in hepatic function in pellagrins[9] and the repeated recording of fatty livers in patients dying from this form of malnutrition who come to postmortem[10] there has hitherto been no reliable evidence of the manner in which the liver may be damaged in pellagra or of the role of the liver in the production of the symptoms of this disease. The fatty liver observed in pellagrins at autopsy has usually been attributed either to the excessive imbibition of alcohol or to the severe diarrhea and secondary infection so frequently encountered in moribund pellagrins.

By a significant improvement in the liver biopsy apparatus described by Iversen and Roholm[11] as well as by a modification in the approach to the liver, we have to date performed more than 200 biopsies on human subjects without a single mishap. We are satisfied that this biopsy procedure is safe and that it is an indispensable procedure for diagnostic and research purposes, especially valuable in the study of nutritional diseases, in which we have shown that the pathologic processes affect the liver diffusely.

For the first time it is now possible to assess the degree of liver involvement in dietary deficiencies in man and to determine the response of the liver to various forms of therapy. Opportunities are now available for ascertaining the state of the human liver in the common deficiency diseases and of discovering whether the results of animal experiments are applicable to man. Although our knowledge concerning the production of liver disease in animals by dietary means is still fragmentary, nevertheless information is steadily accumulating to the effect that, under certain conditions, vitamins can aggravate the liver damage,[12] whereas proteins and various lipotropes have a beneficial effect.[13] Despite this information the majority

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From the University of the Witwatersrand.

Dr. Selbe provided access to patients under his care. Drs. J. Inglis, L. Friedlander and E. Hammar gave their cooperation. Miss Winifred Till prepared the histologic material. Prof. Raymond A. Dart gave encouragement.

Abbotts Ltd. (Johannesburg) provided the liver extract used in this study.

1. Gillman, T.; Gillman, J.; Inglis, J.; Friedlander, L., and Hammar, E.: The Substitution of Whole Stomach Extract for Vitamin in the Treatment of Malignant Infantile Pellagra, Nature, London **154:** 210 (Aug. 12) 1944.

2. Trowell, H. C.: Infantile Pellagra, Tr. Roy. Soc. Trop. Med. & Hyg. **33:** 389, 1940.

3. Spellberg, M. A., and Keeton, R. W.: Production of Fatty and Fibrotic Livers in Guinea Pigs and Rabbits by Seemingly Adequate Diets, Am. J. M. Sc. **200:** 688, 1940. György and Goldblatt.[14] Rich and Hamilton.[14] Handler and Dann.[22]

4. Lillie, R. D.; Daft, F. S., and Sebrell, W. H.: Cirrhosis of the Liver in Rats on a Deficient Diet and the Effect of Alcohol, Pub. Health Rep. **56:** 1255, 1941. Himsworth and Glynn.[6]

5. Best, C. H., and Lucas, C. C., in Harris, R. S., and Thimann, K. V.: Vitamins and Hormones, New York, Academic Press, Inc., 1943, vol. 1, p. 1. Lillie, Daft and Sebrell.[4] Himsworth and Glynn.[6] McHenry and Patterson.[13]

6. Himsworth, H. P., and Glynn, L. E.: Toxipathic and Tropho-pathic Hepatitis, Lancet **1:** 457, 1944.

7. György, P.: Experimental Hepatic Injury, Am. J. Clin. Path. **14:** 67, 1944.

8. Sydenstricker, V. P., and Thomas, J. W.: Some Factors in the Etiology of Pellagra, South. M. J. **30:** 14, 1937. Sydenstricker, Schmidt, Geeslin and Weaver.[23]

9. Spies, T. D.; Sasaki, Y., and Cross, E. S.: Note on the Relationship of Porphyrinuria to Human Pellagra, South. M. J. **31:** 483, 1938. Sydenstricker, V. P., and Armstrong, E. S.: Review of 440 Cases of Pellagra, Arch. Int. Med. **59:** 883 (May) 1937. Slătineanu, A., and others: On Hepatic Injury in Pellagra, Compt. rend. Soc. de biol. **116:** 1113, 1934. Sydenstricker and Thomas.[5]

10. Denton, J.: The Pathology of Pellagra, Am. J. Trop. Med. **5:** 173, 1925. Trowell.[2] Sydenstricker and Thomas.[5]

11. Iversen, P., and Roholm, K.: On Aspiration Biopsy of the Liver, with Remarks on Its Diagnostic Significance, Acta med. Scandinav. **102:** 1, 1939.

12. Engel, R. W.: The Relation of B Vitamins and Dietary Fat to the Lipotropic Action of Choline, J. Nutrition **24:** 175, 1942. Handler and Dann.[22]

13. McHenry, E. W., and Patterson, Jean M.: Lipotropic Factors, Physiol. Rev. **24:** 128, 1944.

of nutritional diseases in man are still universally treated with large doses of synthetic or natural vitamin concentrates.

In previous studies, using material obtained by our biopsy procedure, we have demonstrated that, in adult and infant pellagrins, the liver is invariably damaged,

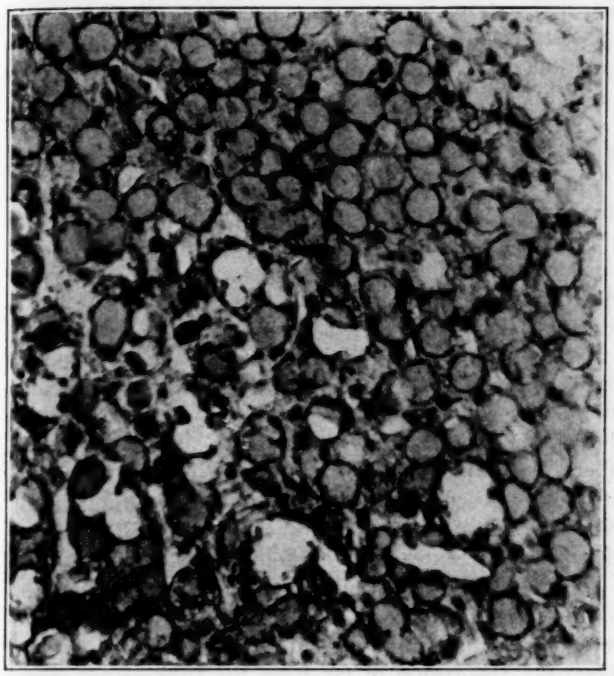

Fig. 1.—Liver in a severe case of infantile pellagra on the day of admission to hospital. Note the large fat globules in almost every liver cell (liver of the first category) × 320.

even in the early stages of this disease.[14] In infants the liver damage is so severe that it could quite easily account for the majority of the clinical features and of the laboratory findings. From this it became evident that the therapeutic measures should be directed not only to the improvement of the clinical condition but also toward the restoration of normal liver structure. Moreover, it appears from our findings that it may be necessary to base the therapy in these diseases not on the present criteria but rather on others dependent on the nature of the liver structure as disclosed by liver biopsy. This seems particularly desirable since, as we shall demonstrate, the liver is frequently severely damaged at the time when patients treated for malnutrition are discharged as clinically cured.

In view of the confidence which most investigators have placed in specific vitamins for the treatment of malnutrition, it became incumbent on us to discover whether this confidence was justified.

This paper is devoted first toward the description of the histologic appearance of the liver in infant pellagrins on admission to the hospital and secondly to an analysis of the effectiveness of vitamins in the treatment of severe malnutrition. It will be shown on the basis of the reactivity of the liver, that vitamin therapy can be deleterious to these patients and that liver extract and especially dried stomach save the lives of infants and children.

14. György, P., and Goldblatt, H.: Hepatic Injury on Nutritional Basis in Rats, J. Exper. Med. **70**: 185, 1939. Rich, A. R., and Hamilton, J. D.: Experimental Production of Cirrhosis of the Liver by Means of Deficient Diet, Bull. Johns Hopkins Hosp. **66**: 185, 1940. Gillman, T. and J., Inglis, Friedlander and Hamma.[1]

MATERIAL AND METHODS

This study is based on the examination of the liver of 20 children suffering from severe infantile pellagra. The salient features of this disease were edema affecting the upper and lower extremities and, in severe cases, the face, eyelids and genitalia; the edema was associated with pellagrous skin lesions on the legs, buttocks, back, arms and face, gray hair or alopecia, as well as patchy or diffuse dermal depigmentation. The stools were, as a rule, bulky, pale and foul smelling and contained much unsplit fat. The serum proteins, both albumin and globulin, were low and a mild microcytic anemia was common. This severe form of malnutrition is apparently identical with that described by other investigators.[15]

Within a few hours of admission to the hospital, liver biopsy was performed. All the patients received a diet which, for their age, was regarded as ideal on present standards. Seven were treated with vitamins orally or parenterally; of these 2 received nicotinic acid 100 mg., thiamine 10 mg. and vitamin C 50 mg. by injection twice daily, together with brewers' yeast and halibut oil by mouth. Five cc. of crude liver extract rich in the Cohn fraction was injected twice daily in another group of 7, while the remaining 6 were fed 10 Gm. of dried stomach (ventriculin) together with 10 cc. of tenth-normal hydrochloric acid once daily. Biopsies were taken of all the infants at weekly or ten day intervals for as long as they remained in the hospital.

The biopsy tissue was fixed in a number of fixatives, chiefly solution of formaldehyde U. S. P. diluted 1 : 10, Helly-osmic and alcoholic picro-formol. Frozen sections of formaldehyde fixed material were stained for

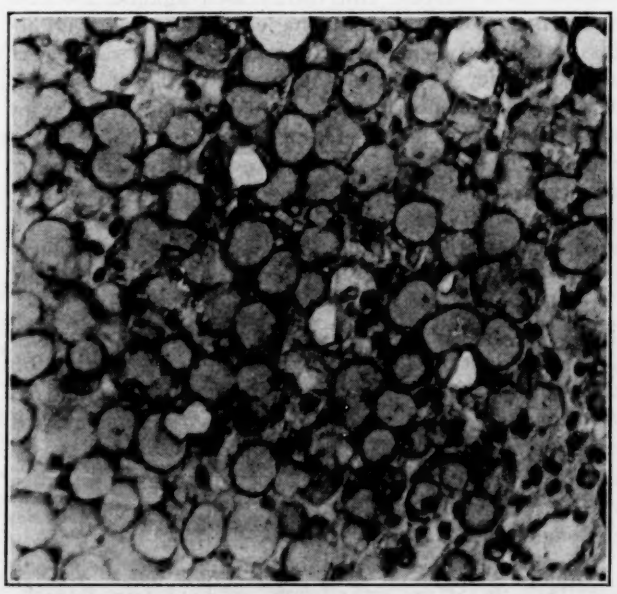

Fig. 2.—Liver of same patient as in figure 1 eight days after treatment with riboflavin, nicotinamide and a full ward diet. Note the deterioration in the liver as compared with figure 1. Patient ultimately died.

fat with scarlet red. Figures 1 to 8 are photomicrographs of frozen sections stained with scarlet red and Ehrlich's hematoxylin (× 320).

15. Williams, C. D.: Nutritional Disease of Childhood Associated with Maize Diets, Arch. Dis. Childhood **8**: 423, 1933. Purcell, F. M.: Diet and Ill Health in the Forest Country of the Gold Coast, London, H. K. Lewis & Co., Ltd., 1939. Kark, S. L.: Adult and Infant Pellagra in South African Bantu: A Comparative Clinical Study, South African J. M. Sc. **8**: 106, 1943. Trowell.[2]

STRUCTURE OF THE LIVER ON ADMISSION

Using as criteria the amount, distribution and the physical appearance of the fat in scarlet red stained preparations, the livers of infantile pellagrins on admission to the hospital have been classified into three main categories.

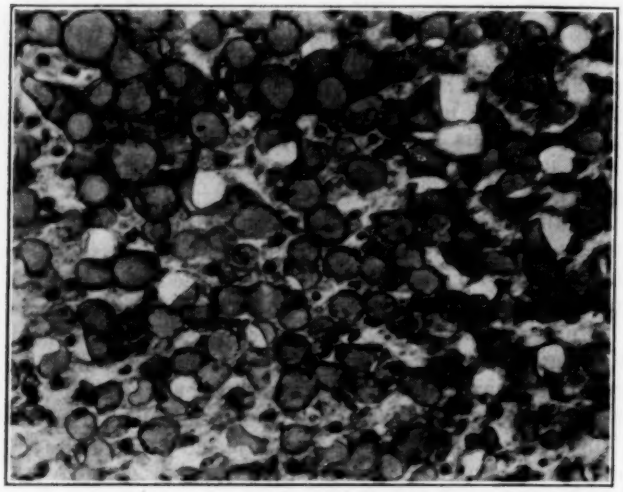

Fig. 3.—Liver in another case of severe infantile pellagra on admission. This liver also belongs to the first category (see text).

In the first category were included 13 of 20 cases. The outstanding feature of these livers was the great abundance of fat distributed throughout the tissue (figs. 1, 3, 6). The fat was in the form of a single large pale-staining globule filling the entire cell. The nucleus was pushed to one pole and the cytoplasm was reduced to a narrow rim compressed against the cell membrane. Almost every single cell was involved in this severe fatty change. In fact, the livers were so fatty that they floated in the fixative. There was no necrosis or hemorrhage. Actually the liver was remarkably avascular. Despite the relatively large pieces of liver available, it was extremely difficult to identify any but the larger radicles of the hepatic veins. The sinusoids were closed, but their position was indicated by the rows of flattened Kupffer cells, which remained fat free except on rare occasions when only a small droplet was observed. The portal tracts were difficult to identify because of the great enlargement of the lobule caused by the massive concentration of fat in the individual cells. In some instances a moderate accumulation of round cells was present in the portal tracts (fig. 6). The reticulum was not thickened. In general the histologic appearance of this type of liver was such that it could be mistaken for perirenal fat.

This liver does not resemble in any way the livers described in acute or chronic carbon tetrachloride poisoning, but it did have a striking resemblance to the livers of rats after two hundred days on the diet of mealie pap and sour milk.[16] This is the type of liver structure encountered in the children who die from infantile pellagra [17] and must therefore be regarded as the most serious type of liver damage.

16. Gillman, J.; Gillman, T.; Gilbert, C., and Mandelstam, J.: The Production of Severe Hepatic Injury in Rats by Prolonged Feeding of Maize-Meal Porridge (Mealie-Pap) and Sour Milk, to be published.

17. Trowell, H. C.: Pellagra in African Children, Arch. Dis. Childhood **12**: 193, 1937; Infantile Pellagra.[3]

In the second category 7 livers are included. The livers in this group are not so closely similar to one another as in the first, but in general they had several features in common. In a liver typical of the group almost all the cells contain multiple coarse droplets of fat and many have a single large fat globule characteristic of the first group (fig. 4). The fat is not in the form of fine granules, nor is it localized in one pole of the cell. In many cells large vacuoles are present. The fat is stained very deeply and in many instances resembles colloid of the thyroid follicle. This peculiar staining reaction applies to the large droplets no less than to the small. Fat droplets may be present in the nuclei, which are irregular in size and undergo chromatolysis, especially in the cells situated near the portal tract. The sinusoids are for the most part closed, but here and there they may be seen as narrow irregular clefts lined by flattened Kupffer cells, some of which may contain a few droplets of fat. The portal tracts may in some instances contain a considerable number of round cells; the connective tissue is slightly more abundant than in the normal, and the collagen fibers are swollen. Iron is extremely scanty and, as a rule, is absent from the hepatic cells, although the Kupffer cells may sometimes contain a few irregular clumps at the extremity of their nuclei.

Only 1 of the livers has been classified as belonging to the third category. The reason for creating this category for a single specimen will become evident when the absorption of fat from the liver under treatment is examined. This liver was different from the others for a number of reasons, which will be considered seriatim.

There was a considerable quantity of fat in the liver, but many cells were fat free; the large fat globules typical of the first group were absent, but instead the cells for the most part contained dustlike particles of fat which gave to the liver a salmon pink color under low power. However, the largest globules of fat exceeded the size of the nucleus, and there were all intermediate sizes between these and the smallest visible particles.

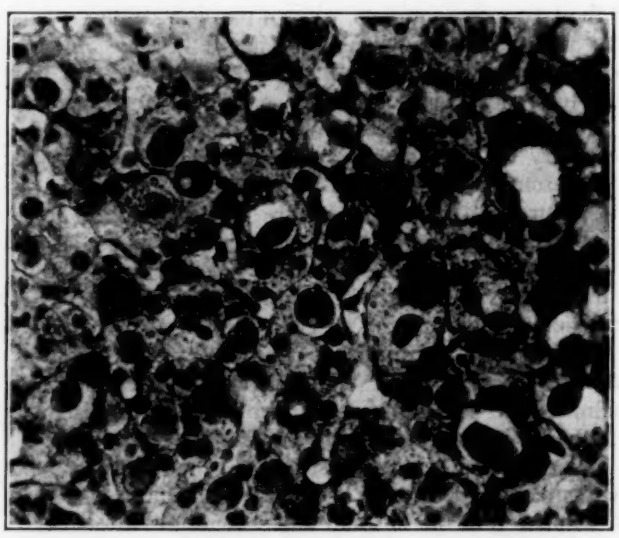

Fig. 4.—Liver of same patient as in figure 3 eleven days after treatment with 10 cc. of crude liver extract daily. Note reduction in the amount of fat, but many large globules are still present.

The fat stained a light yellow; the dense red staining fat was absent. Pigment was very scanty. The portal tracts were accentuated by the accumulation of round cells. The sinusoids were open in many areas, but the Kupffer cells did not contain much fat, as is the case in a comparable liver in adult pellagrins.

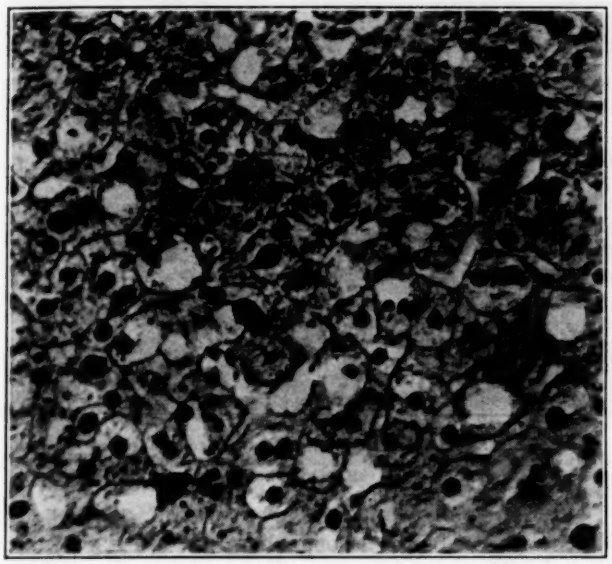

Fig. 5.—Liver of same patient as in figure 3 eighteen days after treatment with liver extract. Biopsy taken on day of discharge. Note continued improvement as compared with figure 4. Residual damage still present.

RESPONSE TO THERAPY

We have found the liver of an infant pellagrin to be infinitely more valuable in assessing the prognosis than the clinical picture or the laboratory findings. It soon became apparent that the state of the child on admission not only failed to indicate the gravity of the disease but was frequently misleading. However, an examination of the biopsy material from the liver invariably allowed us to arrive at an accurate prognosis.

Patients admitted to the hospital with a liver of the second category often recover after any therapy in which the diet is improved. Patients with the livers of the first category usually die. Since the clinical condition of the patient is misleading, in our opinion, the crucial test of the effectiveness of any specific therapy for infantile pellagra is the one wherein the therapeutic agent is able to restore to normal a liver of the first category. It is on this basis that we have compared the value of vitamins, liver extract and dried stomach.

Vitamins.—All the patients whose livers on admission were grouped in the first category died, irrespective of the nature of the vitamins administered. Actually, under vitamin therapy the livers deteriorated. A comparison of figure 1, a photomicrograph of the biopsy of the liver on admission, and of figure 2, the liver after eight days' treatment with 5 mg. of riboflavin twice a day and 50 mg. of nicotinamide intramuscularly, reveals that, if anything, the liver after treatment was even worse than on admission. It must be mentioned at this stage that some patients whose livers on admission were classified as belonging to the second category soon became worse on treatment with brewers' yeast, nicotinic acid and riboflavin. Such patients invariably died.

Liver Extract.—Figure 3 depicts the state of the liver of an infant pellagrin on admission. The large fat globules in the liver cells indicate that this liver belongs to the first category. It is indeed seriously damaged and is comparable with figure 1, the liver of a patient treated with vitamins. At the end of eleven days on liver therapy there is a considerable reduction in the amount of fat in the liver (fig. 4). Many of the cells still contain a single globule of fat, but these are now smaller and stain much more intensely with scarlet red. The nuclei, which in these cells were previously flattened against the cell membrane, have now become round or oval and are diffusely stained with hematoxylin. Medium sized fat globules are present in many cells, while other cells contain large vacuoles, devoid of fat. Numerous cells with a single large fat free vacuole and a flattened nucleus are irregularly scattered throughout the section. The sinusoids are partially open in patches; the Kupffer cells are devoid of fat. The portal tracts are prominent, because of the massive accumulation of round cells.

The liver at this stage has improved as compared with the first specimen (fig. 3) and now belongs to the second category. A third biopsy on the same child eighteen days after admission reveals a further reduction in the amount of fat (fig. 5), but this is not so pronounced as the reduction in fat between the first and second biopsies. Many of the cells still contain single large fat globules, less intensely staining than those seen in the second biopsy. The number of cells without any fat and those with fat free vacuoles has increased; binucleosis is extremely common, and the nuclei are irregular in size and in staining reaction. Many sinusoids are open, and others are in the process of developing patent lumens. The portal tracts still contain large numbers of round cells. At this stage the child was discharged as clinically cured.

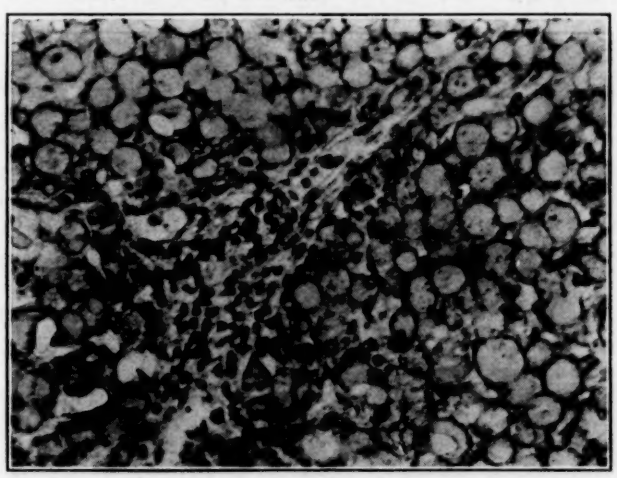

Fig. 6.—Liver of a third patient with severe infantile pellagra on admission. Degree of damage comparable with figures 1 and 3.

It is evident that liver extract has definitely reduced the amount of fat in the liver, but the response is slow. Even when the patient was discharged there was so much residual liver damage that the liver was still classified as belonging to the second category.

Those patients who, on admission, had livers belonging to the second category, when treated with liver extract improved clinically, but even after twenty-one days large fat globules were still present in many of the cells.

From the foregoing it is evident that liver extract can improve a liver of the first category and so remove the fat that the liver now can be regarded as belonging to the second category. Moreover, such treatment can also remove some fat from livers belonging to the second category on admission, but in none of the cases treated with liver extract could the liver be regarded as completely restored when the patients were discharged. It must be mentioned that liver extract is superior to vitamins, as 5 of the 7 infants survived, while in the case of the vitamins all 7 died.

Dried Stomach.—The most dramatic results were obtained with dried stomach. Clinically moribund patients rapidly lost their edema fluid, the skin and oral lesions healed, the diarrhea stopped and the patient recovered within one week. Dried stomach was the only substance so far used by us when the clinical improvement was a reflection of the rapid healing of the liver.

This is well illustrated by the following series of liver biopsies taken from an infant moribund on admission. The first biopsy revealed the liver to be grossly fatty and similar in all respects to the seriously injured livers of the first category (fig. 6). Within ten days there was a sharp reduction in the amount of fat, which at this stage was distributed chiefly in the form of fine particles, with transitions to rather coarse globules exceeding the size of the nucleus (fig. 7). The fat droplets, especially the large variety, stained intensely, as in the livers of the second category, but many cells contained fat stained salmon pink or yellow, as described for the third category. Large vacuolated cells are absent, the sinusoids are patchily dilated and

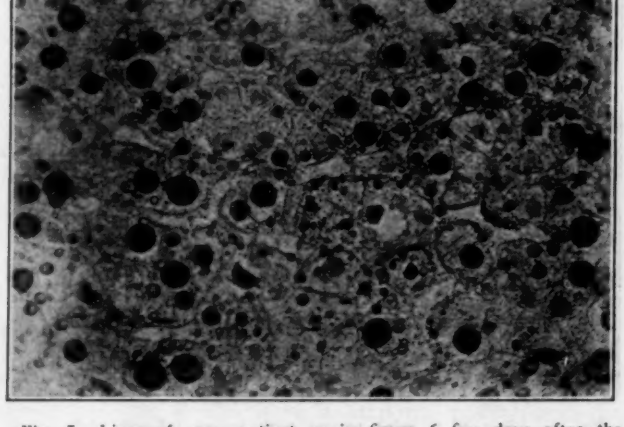

Fig. 7.—Liver of same patient as in figure 6 five days after the cessation of a five day course of dried stomach. Note the improvement as compared with figure 6, but large fat globules are still present in many liver cells.

there is a moderate accumulation of round cells in the portal tract. Dried stomach is the only substance thus far used with which we have been able to convert a liver of the first category into a type intermediate between the second and third within the short period of eleven days. Moreover although dried stomach was administered for only five days, at the end of twenty-one days the fat had become reduced still further and only an occasional cell contained fine droplets of deeply stained fat (fig. 8). The cytoplasm was very watery, while the nuclei of the cells related to the portal tract contain a single large clear vacuole; the sinusoids are

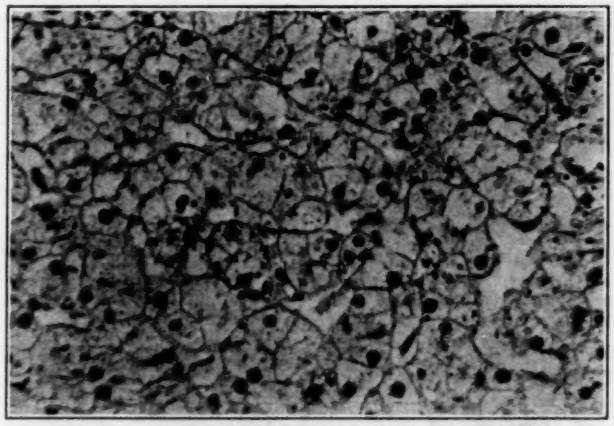

Fig. 8.—Liver of same patient as in figure 6 ten days after cessation of a five day course of dried stomach. Note almost complete disappearance of fat from the liver cell. Only a few fine fat droplets remain. Compare with figures 2 and 5.

for the main closed, although here and there they are dilated. The portal tracts still contain small numbers of round cells.

In those patients with a liver belonging to the second category on admission the fat is also rapidly depleted, but at the end of two weeks it is still present in the form of dark red globules distributed in a patchy fashion.

Dried stomach therapy was continued only for five days, but the livers continued to improve even after the treatment was stopped. Although the livers did not return completely to normal, the results so far obtained were infinitely superior to those following the use of liver extract. Our supply of dried stomach was limited, but we feel that an additional five days treatment might have completely removed all the fat from the liver.

Incomplete treatment with dried stomach may also be associated with mild residual damage which may predispose the patient to a relapse. However, the results obtained thus far indicate that dried stomach acts rapidly on the liver and patients invariably respond within forty-eight hours of treatment irrespective of the severity of the hepatic injury.

COMMENT

One of the striking features of infantile pellagra is the consistent presence of extensive fatty changes in the liver. As we shall show later, hepatic damage is also invariably present in adults suffering from pellagra. Such fatty livers in infantile and adult pellagra have been previously reported only at postmortem.[18] By means of the liver biopsy technic we have been able to demonstrate that the liver may become extensively fatty several weeks before death. In no case of infantile pellagra has the liver been free of fat.

The fatty change in the liver has been so extensive, and the circulation through the liver so bad, that to us it seemed the infant was virtually hepatectomized. The

18. Denton.[10] Trowell.[9] Sydenstricker and Thomas.[8] Trowell.[17]

disturbances in blood protein, hemopoiesis and carbohydrate metabolism in pellagra can be easily attributed to the extensive liver damage. However, despite the extensive injury to the liver, jaundice was not observed in a single case under our observation.

The presence of large quantities of unsplit fat in the stools suggested a deficiency of bile in the alimentary tract. However, Shapiro and his associates,[19] using labeled fat, have shown that even when bile is absent from the bowel the dietary fat is absorbed and, when a fat free diet is fed, large quantities of fat are excreted into the bowel. They concluded that the fatty stool in obstructive jaundice is not due to the interference with the absorption of dietary fat. That the bulky fatty stool so commonly encountered in infantile pellagra is probably due to excessive fat excretion receives support from the fact that the dietary fat in these cases is extremely low and could certainly not account for the large amount of fecal fat. Since the diet of these patients is almost pure carbohydrate, it is possible that the accumulation of large quantities of fat in the liver and in the stool is an expression of the conversion of carbohydrate into fat, together with an inability of the tissues to utilize this fat. At postmortem there is a remarkable contrast between the enormous accumulation of fat in the liver and the extreme depletion from the body depots as expressed by the severe emaciation.

During the last three years we have observed over 250 cases of infantile pellagra, of which 50 per cent ended fatally. In the treatment of this large series of cases vitamins were used orally and parenterally together with a diet balanced in respect of proteins, carbohydrates, fats and natural vitamins. Moreover, in some cases transfusions of blood or concentrated serum also were tried. A mortality rate of over 50 per cent in patients on this regimen cannot be regarded as satisfactory, nor does it indicate that the administration of vitamins and the correction of the diet on the basis of current knowledge can save the lives of patients suffering from severe infantile pellagra.

Trowell [20] has been so impressed by the resistance of this disease to nicotinic acid and other vitamins that he has recently suggested that the name infantile pellagra, which he originally introduced and which we still accept, be replaced by the term "malignant malnutrition."

Whereas we have shown that nicotinic acid removes the fat from the liver in adult pellagrins, albeit this depletion of liver fat is associated with massive deposition of pigment in most instances,[21] in children this vitamin appears to intensify the lesion. Since Handler and Dann [22] have shown that nicotinamide in large doses produces fatty infiltration in the liver of rats, and in view of our confirmation of this finding in human infants, we arrive at the opinion that nicotinic acid is a dangerous form of therapy in severe cases of infantile pellagra. Our experience with thiamine, riboflavin, pyridoxine and brewers' yeast alone, together or in combination with a wholesome diet and serum transfusion, points to the fact that not only are they not life saving measures but they may even hasten the death of a patient with severe infantile pellagra.

Sydenstricker and his collaborators,[23] on the basis of their extensive experience, consider that, of all the substances used by them, liver extracts rich in the Cohn fraction are the most rapidly curative of all the manifestations of pellagra. Elvehjem [24] stated that, in his opinion, "most of the biological activity of liver can be ascribed to free nicotinic acid or its derivatives." Since we have found that while nicotinic acid intensifies the lesions in our cases, and liver extract rich in the Cohn fraction improved the clinical condition and partially depleted the fat from the liver, it follows that the beneficial effects of the liver extract could hardly be ascribed to the nicotinic acid component alone. Liver extract is apparently rich in numerous substances which are considered to be lipotropic.[13] On the other hand, McHenry and Gavin [13] reported that the administration of beef liver extract to rats on a fat free diet caused acutely fatty livers, provided thiamine, riboflavin, pyridoxine and pantothenic acid were also supplied. The complex nature of an extract of liver prevents us from attempting to ascribe its beneficial effects to any single known substance. The fact that the clinical condition improves very slowly when liver extract is administered and that even at the end of five weeks some fat is still present in the liver indicates that this form of therapy is still inadequate to effect a complete cure, even in combination with the full diet. Thus, while Sydenstricker and his associates have found that the intravenous injection of liver extract is the most efficient method for the treatment of pellagra in adults, our experience indicates that it is only partially effective in infants.

Prior to the introduction of nicotinic acid a variety of substances were used in an attempt to discover a specific cure for this widespread disease.[25] In view of the apparent similarity in the clinical manifestations of pellagra and pernicious anemia, Spies and his associates at first treated pellagrins with gastric juice from normal individuals,[26] and then when dried stomach became available through the efforts of Sturgis and Isaacs [27] and Sharp [28] he used this substance in massive doses (750-1,000 Gm. daily) with good results. Sydenstricker and his collaborators confirmed Spies's observations [29] and even went so far as to suggest that pellagra might be due to an intrinsic gastric deficiency unrelated to that described in pernicious anemia.[30] Despite these significant observations, Spies as well as Sydenstricker firmly believed that liver extract was the most valuable form of therapy for pellagra.[31]

19. Shapiro, A.; Koster, H.; Rittenberg, D., and Schoenheimer, R.: Origin of Fecal Fat in the Absence of Bile Studied with Deuterium as an Indicator, Am. J. Physiol. **117:** 525, 1936.
20. Trowell, H. C.: Personal communication to the authors.
21. Gillman, T., and Gillman, J.: The Mitochondrial Origin of Cytosiderin (Iron Pigment) in the Liver of Human Pellagrins, Nature, London **154:** 148 (July 29) 1944.
22. Handler, P., and Dann, W. J.: Inhibition of Rat Growth by Nicotinamide, J. Biol. Chem. **146:** 357, 1942.
23. Sydenstricker, V. P.; Schmidt, H. L., Jr.; Geeslin, L. E., and Weaver, J. W.: The Liver in Pellagra, Am. J. M. Sc. **197:** 755, 1939.
24. Elvehjem, C. A.: Relation of Nicotinic Acid to Pellagra, Physiol. Rev. **20:** 249, 1940.
25. Spies, T. D.: Observations on the Treatment of Pellagra, J. Clin. Investigation **13:** 807, 1934.
26. Spies, T. D.; Payne, W., and Chinn, A. B.: The Relationship of Pellagra to Pernicious Anemia, Proc. Soc. Exper. Biol. & Med. **32:** 328, 1934. Spies, T. D., and Payne, W.: A Study of the Etiological Relationship Between Pellagra and Pernicious Anemia, J. Clin. Investigation **12:** 229, 1933.
27. Sturgis, C. C., and Isaacs, R.: Desiccated Stomach in the Treatment of Pernicious Anemia, J. A. M. A. **93:** 747 (Sept. 7) 1929.
28. Sharp, E. A.: An Antianemic Factor in Desiccated Stomach, J. A. M. A. **93:** 749 (Sept. 7) 1929.
29. Sydenstricker, V. P.; Armstrong, E. S.; Derrick, C. J., and Kemp, P. S.: On the Existence of an Intrinsic Deficiency in Pellagra: Preliminary Report, Am. J. M. Sc. **192:** 1, 1936.
30. Sydenstricker, Armstrong, Derrick and Kemp.[29] Sydenstricker and Thomas.[8]
31. Spies, T. D.: The Treatment of Pellagra by Means of Parenteral Liver Extract, Proc. Soc. Exper. Biol. & Med. **31:** 363, 1933; Observations on the Treatment of Pellagra.[25] Sydenstricker, Schmidt, Geeslin and Weaver.[23] Sydenstricker and Thomas.[8]

With the introduction of nicotinic acid these observations became obscured and no great importance was attached to the casual remarks by Spies and Sydenstricker that relapses were rarer after dried stomach than after liver extract and nicotinic acid.

Apparently unaware of the work of Spies and Sydenstricker, Petri [32] demonstrated the value of an extract of hog's stomach in the treatment of endogenous or secondary pellagra. Later Bandier [33] reported excellent results in primary pellagra with doses of dried stomach infinitely smaller than those used by Spies.[34]

From the literature available it would appear that since that time no further reports have been published concerning the value of dried stomach in the treatment of pellagra.

In most countries clinical and experimental medicine today base their practices almost entirely on the doctrine of causality in its simplest form. In the field of nutrition, disease is said to be caused by the presence or absence of specific substances the addition or subtraction of which is believed to cure that disease. In the earliest phases of acute deficiency diseases this approach may have the desired effect. Thus, feeding a wholesome diet may cure a pellagrin, but clinical experience has shown that despite the application of all known forms of therapy 6 per cent of adult pellagrins still die, and among infants the mortality rate may be as high as 90 per cent.

While dietary imbalance may initiate the disease, secondary changes are produced in the body which not only alter the original character of pellagra but may even determine its subsequent course. Once these secondary changes occur, the treatment of pellagra by the routine procedure proves futile. The new character of the disease now demands an analysis of the secondary pathologic process. In these circumstances the treatment will be determined by the nature of these secondary processes.

Having established that in infantile pellagra the liver is invariably injured to a greater or lesser extent, it seemed logical to assist the recovery of the damaged liver by supplying liver extract. While it was possible to effect a clinical cure together with a significant improvement in the liver, the patients left the hospital with residual liver damage.

From this we concluded that liver extract was incapable of completely curing the disease. Moreover, we appreciated for the first time why relapses occurred so frequently in adult pellagrins who on clinical grounds were pronounced as cured after liver therapy.

For this reason we directed our attention to other organs, such as the stomach and the nervous system, which are known to be implicated in this disease and which may initiate and maintain the pathologic processes in the liver.

It is not our object in this study to consider the possibilities of effecting a cure of pellagra through the nervous system, although Speransky has already suggested that this may well be achieved.[35]

Petri's description of gastroprival pellagra in man and in gastrectomized swine [36] became significant especially since gastric dysfunction is such a constant finding in pellagrins.[37] Moreover, endogenous pellagra originating primarily from gastric damage failed to respond to nicotinic acid but improved rapidly with stomach extracts.[36] It seemed, therefore, that pellagra of dietary origin was an expression of disorder of the gastrohepatic complex, and therefore the administration of dried stomach appeared to be a possible way of curing the refractory forms of pellagra in adults as well as in children.[1] The rapid improvement of the clinical condition, the resolution of the edema and the remarkable improvement in the structure of the liver (figs. 6, 7 and 8) leave no doubt in our minds that dried stomach is the most valuable single therapeutic agent available at present for saving the lives of children suffering from severe malnutrition.

In view of the rapid depletion of the large deposits of fat in the livers of infantile pellagrins, stomach extract must be regarded as a vigorous lipotrope. Since we have administered only 10 Gm. of dried stomach daily it is unlikely that this lipotropic action could be ascribed to its choline content. It is possible that the beneficial effects obtained with large doses of liver extract may be ascribed to a factor similar or complementary to that contained in stomach extracts.

One other aspect of the action of this gastric extract requires comment. An outstanding feature of cases of infantile pellagra is a severe and extensive edema. Liver extract produces a slow resolution of this edema. However, after the administration of dried stomach there is a rapid diuresis. Within twenty-four to forty-eight hours the infant may lose anything from 8 to 20 ounces in weight as the result of the rapid depletion of edema fluid. After four to seven days on dried stomach the edema is completely resolved. Dried stomach, therefore, is not only a potent lipotrope, but in these patients it also has a vigorous diuretic action.

From the foregoing it is evident that the liver of infants is severely damaged, even within six to eight months of birth, by dietary imbalance. Owing to the poor economic status of the African, a history of repeated attacks of acute malnutrition is invariably elicited from adult pellagrins. Each attack damages the liver. Cirrhosis has been encountered even in children under the age of 10, and in adults, by repeated liver biopsies, we have observed the development of pigment cirrhosis within six months of an attack of pellagra.

We consider the high incidence of cirrhosis and primary carcinoma of the liver in adolescent and young adult Africans as being due in no small measure to repeated insults to the liver resulting from acute and chronic malnutrition.

SUMMARY AND CONCLUSIONS

1. By means of liver biopsies we have established that, on admission to the hospital the livers of infantile pellagrins show various degrees of fatty change; in

32. Petri, S.; Wanscher, O.; Stubbe Teglbjaerg, Else, and Stubbe Teglbjaerg, H. T.: Treatment of Pellagra with Stomach Preparations: Its Gastrogenic Etiology and Relationship to Polyneuritis, Acta med. Scandinav. **93:** 450, 1937.

33. Bandier, E.: On the Treatment of Exogenous Pellagra with Stomach Preparation, and Considerations on the Possible Identity of the Vitamin B_2 Complex with the "Cyanide Insensitive Enzyme Complex," Acta med. Scandinav. **101:** 496, 1939.

34. Spies, T. D.: The Treatment of Pellagra, J. A. M. A. **104:** 1377 (April 20) 1935; Observations on the Treatment of Pellagra.[35]

35. Speransky, A. D.: A Basis for the Theory of Medicine, Moscow, Inra Cooperative Publishing Society, 1935, p. 396. Gillman, J., and Gillman, T.: A Review of Speransky's Theory of the Role of the Nervous System in Disease, Am. Rev. Soviet Med., to be published.

36. Petri, S.; Nørgaard, F., and Bing, J.: Pathological Changes Produced by Gastrectomy in Young Swine, Am. J. M. Sc. **195:** 717, 1938.

37. Mulholland, H. B., and King, R. L.: Pellagra: Review of Cases with Special Reference to Gastric Secretions, J. A. M. A. **101:** 576 (Aug. 19) 1933. Flinker, R.: The Function of the Stomach in Pellagra, Arch. f. Verdauungskr. **57:** 282, 1935. Rubio, D. M.: Studies in Pellagra: I. The Gastric Secretion, Trop. Dis. Bull. **40:** 79, 1943. Gillman, T.: A Critical Evaluation of the Neutral Red Excretion and Acid Secretion Tests of Gastric Function in the Normal and in Subjects with Gastric Disorders, Gastroenterology **3:** 188 (Sept.) 1944. Eddy, W. H., and Dalldorf, G.: The Avitaminoses, ed. 2, Baltimore, Williams & Wilkins Company, 1941.

severe cases almost every liver cell is distended by a single large globule of fat. Liver biopsy is indispensable in establishing the prognosis and in assessing the effectiveness of any form of therapy.

2. The reactions of the liver to vitamins, liver extract and dried stomach have been studied in a selected series of 20 infantile pellagrins with comparable hepatic lesions on admission.

3. In severe cases the administration of vitamins intensified the accumulation of fat in the liver cells. Every one of the 7 cases treated with vitamins terminated fatally.

4. Although liver extract rich in the Cohn fraction is superior to vitamins, the fat is depleted from the liver slowly despite the clinical recovery. Only 2 of the 7 cases in this group ended fatally.

5. Dried stomach in 10 Gm. doses daily in combination with hydrochloric acid leads to spectacular recovery of the patient and loss of edema fluid. Moreover, the fat in the liver disappears rapidly and almost completely in every instance. All the patients treated with dried stomach recovered.

6. Although the fat content of the diet is low, there is a massive accumulation of fat in the liver, and it is excreted in large amounts in the feces despite the emaciation of the rest of the body. It is suggested that, in infantile pellagra, carbohydrate is converted into fat which cannot be utilized.

7. We conclude that the administration of vitamins in severe nutritional edema associated with pellagrous lesions in infants can be extremely dangerous and is contraindicated.

8. On the basis of the results obtained in our carefully selected cases, dried stomach is the most valuable therapeutic agent available for the treatment of severe infantile pellagra. Since dried stomach causes the rapid depletion of fat from the liver, it must be regarded as a vigorous lipotrope.

9. In children discharged as clinically cured, liver biopsy has revealed the existence of residual liver damage, the extent of which is determined by the severity of the initial lesion and the nature of the therapy.

10. Recurrent attacks of subclinical and overt malnutrition result in progressive hepatic damage. These repeated insults are in no small measure responsible for cirrhosis and probably for primary carcinoma of the liver so frequently encountered in young Negroes in South Africa.

Regulation of Body Temperature.—Heat loss can occur through conduction, radiation, convection and vaporization. The amount of heat lost through these four channels depends chiefly on the surface area of the body and the difference between its temperature and that of the surroundings. The temperature of the skin depends on the rate at which blood passes through the cutaneous vessels. Thus vasomotor changes in the skin capillaries are most effective in controlling heat loss by radiation and convection. Heat loss by vaporization of water occurs in the lungs and from the surface of the skin. Any increase in respiratory ventilation augments the heat loss by vaporization from the lungs, while nervous control of perspiration limits the heat loss by evaporation of water from the skin. Thus, the control of heat loss is effected by the interplay of a number of physiologic processes—circulatory, respiratory and nervous in character.—Shock, Nathan W., from Mental Disorders in Later Life, edited by Oscar J. Kaplan, Stanford University Press, 1945.

THE EFFECTS OF CONCENTRATED HYPERIMMUNE RABBIT SERUM IN LOUSE BORNE TYPHUS

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The treatment of classic louse borne typhus with immune serum of various types has been described in many reports. Most of the attempts indicated that human convalescent serum had no noticeable effect on the course of typhus. The serums obtained from animals after they had recovered from experimental typhus have also been given a clinical trial, but the reports of the therapeutic value of such serums have been somewhat conflicting. The early literature has been reviewed by Otto and Munter.[1]

More recently the development of satisfactory technics for the cultivation of rickettsias in large quantities has facilitated the hyperimmunization of animals. Zinsser, Castaneda and Hager [2] prepared a serum by inoculation of horses with rich suspensions of murine rickettsias obtained from x-rayed rats. Durand and Balozet, by inoculations with rickettsias from infected lungs of rodents, obtained a hyperimmune horse serum against epidemic louse borne typhus,[3] which was reported on favorably in recent therapeutic trials.[4] Wolman,[5] after treating 220 patients in Ethiopia with antityphus horse serum, reported that the treated patients had a lower mortality and a shorter illness than the untreated patients. Kurotchkin, van der Scheer and Wyckoff [6] used infected yolk sacs of developing chick embryos [7]

From the Cairo unit of the United States of America Typhus Commission.

Numerous chemical determinations for the cases in this study were performed by the 38th General Hospital Laboratory staff.

Technical assistance was given by Sergeant Stephens and Corporal Stearman in the laboratory work performed on the serum-treated patients.

The authors received generous cooperation from the officials of the Egyptian Ministry of Public Health, who facilitated the studies of the United States of America Typhus Commission in Egypt.

Serologic tests and strain isolations were performed by Col. Harry Plotz and Capt. Byron Bennett, with the assistance of Sergeant Guin and of Dr. Tabet of the Egyptian Serum and Vaccine Institute.

The director of the Cairo Fever Hospital, Dr. M. A. B. Demerdash Bey, made possible the establishment of the United States of America Typhus Commission ward and laboratory in his institution and gave helpful advice and cooperation.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writers and are not to be considered as reflecting the policies of the Navy Department.

1. Otto, R., and Munter, H.: "Fleckfieber" Handbuch der pathogen. Mikroorganismen, ed. 3, 1929, vol. 8, pp. 1107-1262.

2. Zinsser, H.; Castaneda, M. Ruiz, and Hager, F. D.: Protective Action of Concentrated Antityphus Serum (Murine Type) Against European Typhus Virus, Proc. Soc. Exper. Biol. & Med. **33**: 44, 1935.

3. Durand, P., and Balozet, L.: Préparation d'un sérum anti-exanthématique, par inoculations de rickettsias de poumons de souris, Arch. Inst. Pasteur, Tunis **29**: 363, 1940.

4. Durand, P., and Balozet, L.: Sérothérapie antityphique, 120 cas de typhus traités par le sérum obtenu par inoculations de rickettsias de poumon de souris, Arch. Inst. Pasteur, Tunis **30**: 1-22, 1941; Sérothérapie du typhus épidémique par sérum de cheval hyperimmunisé: Résumés des communications, Congrès médical interallié, Algiers, February 1944, p. 14. Secret, E.: Recherches sur l'abortion du typhus exanthématique par l'immunothérapie précoce, ibid., p. 16.

5. Wolman, M.: Treatment of Typhus with Antityphus Horse Serum, Lancet **2**: 210-212 (Aug. 12) 1944.

6. Kurotchkin, T. J.; Van der Scheer, J., and Wyckoff, R. W. G.: Refined Hyperimmune Rickettsial Sera, Proc. Soc. Exper. Biol. & Med. **45**: 323, 1940.

7. Cox, H. R.: Cultivation of Rickettsiae of the Rocky Mountain Spotted Fever, Typhus and Q Fever Groups in the Embryonic Tissues of Developing Chicks, Science **94**: 399, 1941.

to hyperimmunize rabbits. They refined and concentrated the immune serum by a process similar to that used in the production of antipneumococcus serum. Topping [8] reported that serum prepared in this manner against spotted fever showed definite therapeutic value if treatment was instituted in the first few days of illness. In laboratory studies the refined and concentrated antityphus rabbit serum has shown a striking effect in experimental typhus. The febrile response of guinea pigs,[9] the death of white mice from several lethal doses of rickettsial toxic substances [10] and the fatal infection of cotton rats [11] can be prevented by the hyperimmune serum in high titer. In this regard Felix [12] cited evidence from which he concluded that "the efficacy of a therapeutic antityphus serum depends on the presence in it of effective amounts of the two different antibodies corresponding to the heat labile and heat stable rickettsial antigens." Although the rabbit serum does not contain appreciable amounts of antibodies which agglutinate proteus OX 19, the high concentration of neutralizing and complement fixing antibodies [13] in this rabbit serum, its striking properties against experimental typhus and the favorable effects of a similar serum against another rickettsial disease of man were considerations which prompted the clinical trial of hyperimmune rabbit serum in typhus. The distinctly beneficial effect observed in patients treated with serum early in the course of louse borne typhus is the subject of this report.[14]

In February 1943 the United States of America Typhus Commission, in cooperation with the officials of the Egyptian Ministry of Public Health, established an experimental ward in the Cairo Fever Hospital.[15] The study of the therapeutic effect of hyperimmune rabbit serum was begun near the peak of the epidemic, in April 1943. Twenty-five cases of typhus were treated with varying amounts of serum.[16] For reasons which are not pertinent to this discussion the usual method for therapeutic trials, the alternation of control and treated cases, was not followed. Instead, the 25 treated cases were admitted in consecutive order to the Commission ward. The background of experience during two epidemic years in the Cairo Fever Hospital is drawn on to provide a control group for comparison with the serum treated group. All of the cases discussed in this paper were considered to be certain cases of typhus on the basis of clinical and laboratory evidence. The numerous strains which have been isolated from the cases in the Commission ward have uniformly shown the characteristics of epidemic louse borne typhus.[17]

8. Topping, N. H.: Rocky Mountain Spotted Fever: Further Experience in the Therapeutic Use of Immune Rabbit Serum, Pub. Health Rep. **58**: 757, 1943.

9. Wyckoff, R. W. G., and Bohnel, E.: Therapeutic Effect in Guinea Pigs of Hyperimmune Epidemic Typhus Antiserum, Proc. Soc. Exper. Biol. & Med. **49**: 712, 1942.

10. Veldee, M. V.: Letter dated April 19, 1943 to the Director of the United States of America Typhus Commission, from the Division of Biologics Control of the National Institute of Health, U. S. Public Health Service.

11. Snyder, J. C.: Unpublished observations.

12. Felix, A.: The Typhus Group of Fevers Classification, Laboratory, Diagnosis, Prophylactic Inoculation and Specific Serum Treatment, Brit. M. J. **2**: 597, 1942.

13. Zarafonetis, C. J.: Personal communication to the authors.

14. A recent paper has been published by R. S. Stevens (Louse-Borne Typhus Fever: Trial of Serum Treatment, Lancet **1**: 106-109 [Jan. 27] 1945) concerning the treatment of 7 unvaccinated patients with typhus among British army personnel by hyperimmune antityphus rabbit serum. The serum administered to these patients and supplied by Brig. General L. A. Fox, Field Director, United States of America Typhus Commission, was the same as that used in our studies. The author's conclusions as to the effect produced by the early administration of this serum in louse borne typhus are in general agreement with our findings.

15. Bayne-Jones, S.: The United States of American Typhus Commission, Army M. Bull., July 1943, number 68, pp. 4-15.

16. The serum used in this study was prepared by the Lederle Laboratories, Inc.

17. Letter of Dr. N. H. Topping to the Director of the United States of America Typhus Commission, dated Nov. 6, 1943. Plotz, H.; Wertman, K., and Bennett, B. L.: The Serological Pattern in Epidemic Typhus Fever: 1. The Development of Complement Fixing Antibodies, from the Division of Virus and Rickettsial Diseases, Army Medical School, Army Medical Center, Washington, D. C., December 1943, to be published. Unpublished observations of the authors.

SELECTION OF CASES

The 25 patients who were selected for serum treatment were unvaccinated Egyptian men in the age group 18 to 48 years who had no obvious complicating conditions at the time of admission, whose date of onset of illness was clear and who were not later in their disease than the seventh twenty-four hours.

Of the 159 patients who were studied in the Commission ward in 1943 and 1944 there were 44 patients who conform to the criteria cited. This group received no special therapy other than nursing care, fluids and appropriate measures to combat complications which arose during hospitalization. For the purpose of comparison with the cases treated with serum, the 44 are designated as the "untreated" control group. Their clinical course was representative of the entire experience of the Commission ward.

The high mortality of the typhus cases in the general wards of the Fever Hospital during the period covered by our observations on serum treatment provides evidence that the typhus epidemic was severe. In May and June 1943 a total of 1,719 Egyptian men aged 18 to 48 were admitted to the general wards of the Fever Hospital suffering from typhus, and of these 393 died, a mortality of 23 per cent. This figure is approximately the same as that for the two entire epidemic seasons, and it indicates that there was no appreciable change in the severity of the epidemic in May and June 1943 which might confuse the observations of the effects of a therapeutic agent.

ESTIMATION OF SEVERITY OF ILLNESS

To facilitate the analysis of cases an arbitrary classification of clinical severity was decided on. After discharge from the hospital each patient was classified on the basis of his clinical course. The principal factors which influenced the estimation of severity were the intensity of subjective symptoms (headache, generalized bodily aches and pains, tinnitus, deafness); the degree of prostration; the extent of central nervous system involvement (mental dulness, stupor, coma, incontinence of urine and feces, abnormal neurologic signs); the severity of cardiovascular system involvement (hypotension, tachycardia, peripheral vascular failure, myocardial damage); and, finally, the occurrence of urinary retention, oliguria, nitrogen retention, bronchopneumonia, otitis media, parotitis, furunculosis and gangrene. With these factors in mind the following classification was made:

A. Cases so mild that a definite diagnosis of typhus on clinical evidence alone was not possible, the final diagnosis being made only with the aid of positive laboratory data.

B. Cases with minimal symptoms and signs, yet definitely diagnosed as typhus on clinical evidence.

C. Cases of moderate severity, showing slight prostration, central nervous system involvement, cardiovascular changes or mild complications.

D. Severe typhus cases, with definite prostration, central nervous system involvement, cardiovascular changes or serious complications.

E. Cases of such severe illness that a fatal outcome was expected at some point in the clinical course.

F. Fatal cases.

PLAN OF TREATMENT

Each patient was tested for sensitivity by the introduction of 0.1 cc. of undiluted rabbit serum into the skin of the forearm. After an interval of twenty minutes the test was observed, and, if negative, serum therapy was begun. Serum was given intramuscularly or intravenously or by a combination of the two routes. The different methods and varying dosages used in the treatment of the first cases reflect the difficulties encountered in our attempts to decide what amount of serum should be given and over what period of time therapy should be maintained. A plan of treatment gradually evolved which seemed to be satisfactory. It was as follows: The initial dose was 1 cc. of serum for each pound of body weight, half administered intravenously and half intramuscularly. The second and third doses were each 0.25 cc. per pound of body weight and were administered intramuscularly twenty-four and forty-eight hours after the initial dose. It was thought that this plan of treatment would maintain a relatively high concentration of the rabbit serum in the patient's blood stream for several days.

OBSERVATIONS DURING THE ADMINISTRATION OF SERUM

When serum was given intravenously, the blood pressure, pulse and respirations were recorded at short intervals. Subjective and objective effects of the introduction of serum were noted.

Intravenous injections of serum were made at varying rates. At the outset the rate was 0.5 cc. per minute. As soon as it was observed that such a rate of injection produced no serious effects, it was increased, and maximum being 4 cc. per minute. However, in each case in which serum was administered intravenously for the first time the initial rate did not exceed 0.5 cc. per minute for the first 5 cc. injected.

Chills of varying intensity occurred during seven injections. At the onset of each chill the rate of injection was reduced. It was not found necessary to discontinue any injection because of this reaction. In 1 case severe chills occurred on two occasions from one to three hours after administration of serum. It is our opinion that these reactions were most probably due to imperfectly prepared glassware and were not dependent on any substance in the serum itself.

Vomiting occurred during one injection. This was coincidental with a fall of 24 mm. in systolic and of 20 mm. in diastolic blood pressure. Nausea occurred in 2 cases; in 1 of these there was a coincidental drop in blood pressure from 96/50 to 80/40.

A fall in blood pressure, not exceeding 25 mm. in systolic and 20 mm. in diastolic, occurred in 3 cases.

The onset of headache or the increase of headache was observed during eleven injections. This headache was frontal in type. On occasions it appeared to be related to the speed of injection.

Suffusion of the conjunctivas was seen during four injections. It was accompanied by headache, or increase in headache, and disappeared promptly when the injection was finished.

Extrasystoles were observed during two injections. In 1 of these cases the irregularity had been noted before the administration of serum was begun. Extrasystoles were noted only during injection in the other case.

TABLE 1.—*Data Obtained from 25 Cases of Epidemic Louse Borne Typhus Fever* Treated with Concentrated Hyperimmune Antityphus Rabbit Serum*

No.	Age. Yrs.	Body Weight, Lbs.	Duration of Illness When Treatment Begun, Days	Duration of Treatment, Days	Total Amount Serum Given: Intramuscularly, Cc.	Total Amount Serum Given: Intravenously, Cc.	Total Amount Serum Given: By the Two Routes Combined, Cc.	Duration of Fever,‡ Days	Maximum Nonprotein Nitrogen, Mg. per 100 Cc.	Strain Isolation †	Maximum Titer †: Weil-Felix OX 19	Maximum Titer †: Complement Fixation Epidemic	Serum Sickness	Complications	Clinical Classification of Severity
1	30	114	2	3	100	0	100	7	23	.....	80	24	0	None	B
2	26	125	2	5	220	0	220	14	35	Pos.	640	48	Yes	None	C
3	20	99	2	4	0	405	405	8	31	.....	640	48	?	None	B
4	20	100	2	3	90	60	150	7	..	Pos.	80	96	Yes	None	A
5	23	129	2	3	131	66	197	8	38	Pos.	5,120	96	Yes	None	B
6	23	123	3	6	200	39	239	10	70	.....	1,280	96	0	Nitrogen retention §	B
7	19	117	3	1	60	56	116	17	38	Pos.	640	48	0	Furunculosis, abscess of thigh	D
8	24	134	3	3	133	67	200	11	41	Pos.	2,560	48	Yes	None	C
9	30	112	3	3	122	46	168	12	38	Pos.	1,280	24	0	None	E
10	45	99	3	3	100	50	150	13	35	Pos.	2,560	12	0	None	B
11	19	121	4	1	0	58	58	11	36	Pos.	2,560	192	0	None	C
12	19	109	4	2	30	39	69	17	35	.....	40	24	0	None	C
13	20	109	4	1	0	51	51	10	32	.....	640	48	0	None	C
14	20	111	4	5	198	20	218	14	33	Pos.	5,120	96	?	Bronchopneumonia	D
15	20	119	4	5	0	512	512	11	37	Pos.	1,280	96	0	None	D
16	30	122	4	5	175	316	491	20	27	Pos.	640	48	0	Bronchopneumonia, neuritis, otitis	D
17	40	121	4	3	120	60	180	18	136	Pos.	640	48	Yes	Nitrogen retention	D
18	34	123	5	3	80	0	80	17	126	.....	640	192	0	Nitrogen retention	E
19	25	110	5	3	120	0	120	22	138	Pos.	160	192	0	Nitrogen retention, cystitis, otitis media, gangrene	E
20	25	152	5	1	0	78	78	18	75	Pos.	5,120	384	0	Nitrogen retention, bronchpneumonia	E
21	31	120	5	5	180	40	220	12	31	Pos.	2,560	384	0	None	C
22	20	117	5	6	240	20	260	12	36	Pos.	5,120	96	Yes	None	C
23	26	112	6	3	80	0	80	14	..	.....	1,280	0	0	None	B
24	23	126	6	1	0	59	59	13	107	Pos.	640	192	Yes	Nitrogen retention	D
25	21	124	6	6	218	20	238	12	31	Pos.	10,240	96	0	None	C

* Unvaccinated Egyptian men in the age group 18 to 48 who were admitted to the Commission ward in the first week of illness.

† The isolation of strains and the serologic tests were performed by Colonel Plotz and Captain Bennett.

‡ Rectal temperatures were taken at four hourly intervals on all of the patients in this study. A temperature above 37.5 C. (99.5 F.) is considered evidence of fever.

§ Values of the blood nonprotein nitrogen above 45 mg. per hundred cubic centimeters are regarded as evidence of nitrogen retention.

Urticaria was noted in 1 case. The skin test was negative. After the injection of approximately 40 cc. of serum in twenty-two minutes several large round urticarial wheals with red bases but no pseudopods appeared on the trunk and limbs. The injection was completed (10 cc. more) and no further reactions occurred.

The skin test in 1 case was thought to give a questionably positive reaction. There was swelling of the wheal with a red base, and one pseudopod. This type of reaction was not considered a contraindication to therapy, and subsequent injection was not accompanied by any further reaction.

Intramuscular injections of serum were given into the buttocks. The greatest amount given by this method was 115 cc. in twenty-four hours. Aside from temporary swelling and tenderness in this particular case, no unfavorable reactions to intramuscular injections were noted.

DOSAGE

The total amount of serum given to each patient varied from 51 to 512 cc. The average dose for the 25 patients was 186 cc. The duration of serum therapy and the total amounts given by intravenous and intramuscular routes appear in table 1.

TABLE 2.—*The Individual Ages, Duration of Fever and Clinical Severity of 44 "Untreated" Control Cases Arranged According to the Day of Illness at the Time of Admission to the Commission Ward* *

Day of Disease †	Number, Age and Days of Fever of the Patients in Each Clinical Classification of Severity					
	A	B	C	D	E	F ‡
First	.....	.....	.....	39. 21-25		
Second						
Third	.....	.....	.....	40. 28-15 41. 20-19 42. 21-16		
Fourth	.....	.....	27. 26-12 28. 22-10	43. 32-13 44. 25-27	.....	62. 30
Fifth	.....	.....	29. 20-17 30. 20-16	45. 22-14 46. 22-27	57. 18-18 58. 35-27 59. 35-16	63. 35 64. 36 65. 30 66. 46 67. 26
Sixth			31. 32-18	47. 23-15 48. 23-16 49. 18-21 50. 25-19 51. 30-18	60. 25-18 61. 19-38	68. 43
Seventh		26. 27-18	32. 25-17 33. 25-15 34. 20-16 35. 47-14 36. 21-14 37. 21-16 38. 24-16	52. 27-14 53. 21-35 54. 29-14 55. 22-17 56. 22-19	.....	69. 21

* Unvaccinated Egyptian men in the age group 18-48 who were admitted to the Commission ward in the first week of illness.

† "Day of Disease." For the 44 control cases this refers to the day of illness at the time of admission to the Commission ward. For the 25 serum treated cases, it refers to the day of illness at the time serum treatment was first begun; two patients (18 and 20) were admitted to the Commission ward one day before serum treatment was started. All of the other patients received treatment on the day of admission.

‡ The duration of fever of fatal cases is not included in the table.

RESULTS OF SERUM TREATMENT

The data obtained from the entire group of serum treated cases are presented in table 1, in which the patients were arranged according to the duration of illness at the time treatment was first started.

Table 2 presents data on the individual ages, duration of fever and clinical severity of the "untreated" control cases. The various aspects of these tables will now be discussed.

Effect on Clinical Severity.—The clinical severity of the 25 cases treated with serum is compared with the 44 "untreated" control group in table 3. There was only 1 mild (A or B) case in the "untreated" group,

TABLE 3.—*Comparison of the Clinical Severity of 44 "Untreated" Patients* and 25 Patients* Treated with Concentrated Hyperimmune Rabbit Serum*

	Number and Percentage of Patients in Each Classification					
	A	B	C	D	E	F
44 "untreated" cases.....	0 0	1 2%	12 27%	18 41%	5 11%	8 18%
25 serum treated cases.....	1 4%	7 28%	8 32%	6 24%	3 12%	0 0

* Unvaccinated Egyptian men in the age group 18 to 48 admitted to the Commission ward in the first week of illness.

TABLE 4.—*Comparison of the Average Duration of Fever and Clinical Severity of 44 "Untreated" Cases* and 25 Cases* Treated with Concentrated Hyperimmune Rabbit Serum*

Classification of Severity	Average Duration of Fever	
	44 "Untreated" Cases, Days	25 Serum Treated Cases, Days
A.....	..	7
B.....	18	10½
C.....	15	12½
D.....	19½	15½
E.....	23½	19
F.....	(13)	..
Average of all cases except F.....	18½	13

* Unvaccinated Egyptian men in the age group 18 to 48 admitted to the Commission ward in the first week of illness.

whereas the serum treated group contained 1 A case and 7 B cases. There were no deaths among the serum treated group; 8 control patients died. The relative percentages of C, D and E cases were approximately the same in the two groups.

Effect on the Average Duration of Fever.—The average duration of fever for treated and control groups is shown in table 4. The treated patients had an average febrile period of thirteen days, as contrasted with eighteen and one-half days for the "untreated" control patients.

Relation of Duration of Illness at the Time Serum Was Started to the Clinical Course of the Patients.—The importance of early treatment can be seen in table 5, which shows the clinical severity of the 25 serum treated cases arranged according to the duration of illness at the time therapy was first started. Ten cases were treated in the second and third days of illness; 1 was an A case, 6 were B cases, 2 were C cases and 1 was a D case. These results are in sharp contrast to the 15 cases whose therapy was begun after the third day of illness; of these 1 was a B case, 6 were C cases, 5 were D cases and 3 were E cases. In the latter group the principal difference from the "untreated" control group was that there were no fatal cases. Otherwise the distribution of clinical severity was almost identical.

The Effect of Serum Treatment in Relation to the Age of the Patient.—The average age of the serum treated patients in each clinical classification is com-

pared with the corresponding figures for the "untreated" control group in table 7. There was no appreciable difference in average ages which might account for the high incidence of mild cases in the serum treated group.

Effect on the Rash.—Among the 5 patients who received serum in the second day of illness there were 2 who did not develop a rash and a third who had very questionable macules for one day only. All the other serum treated cases developed a characteristic typhus rash.

Effect on Kidney Function.—The blood nonprotein nitrogen was determined in 23 of the serum treated cases. Values above 45 mg. per hundred cubic centimeters were observed in 6 cases, or 26 per cent (table 1). In the "untreated" control group values above 45 mg. per hundred cubic centimeters occurred in 44 per cent of the patients from whom data were available.

Occurrence of Serum Sickness.—Seven patients in the group developed mild serum sickness. Two other patients had transient discomfort which was probably a manifestation of very mild serum sickness.

Isolation of Strains.—In most of the cases the attempt was made to isolate rickettsias from the blood of the patients before serum was administered. Positive febrile responses in guinea pigs were reported from 18 patients (table 1). On several occasions, positive results were obtained from the inoculation of blood which was drawn after varying amounts of serum had been given. In 1 instance, patient 4, the isolation of a strain helped to establish the diagnosis, since the clinical picture was too mild for a definite diagnosis of typhus.

TABLE 5.—*Comparison of the Clinical Severity of 25 Serum Treated Cases* with the Duration of Illness at the Time Serum Treatment was Started*

Day of Disease When Treatment Started	Number of Patients in Each Classification					
	A	B	C	D	E	F
Second	1	3	1	..	..	..
Third	..	3	1	1	..	..
Fourth	..	..	3	4	..	..
Fifth	..	..	2	..	3	..
Sixth	..	1	1	1	..	..

* Unvaccinated Egyptian men in the age group 18 to 48 admitted to the Commission ward in the first week of illness.

TABLE 6.—*Comparison of the Clinical Severity of 25 Serum Treated Cases,* with the Average Amount of Serum Administered*

Average Number of Cubic Centimeters of Serum Given to the Patients in Each Classification					
A	B	C	D	E	F
150	191	165	263	93	..

* Unvaccinated Egyptian men in the age group 18 to 48 admitted to the Commission ward in the first week of illness.

Relation of the Total Amount of Serum to the Clinical Course.—The average amount of serum which was administered to the patients in each clinical classification appears in table 6. The 3 cases classified as E were among the first 5 in the treated series. An average of 93 cc. of serum was administered whereas in the other groups the amount was from 150 to 263 cc. One of the 3 E cases was treated with a single intravenous dose of 78 cc. as a trial of that particular plan of therapy. The other 2 E cases presented oliguria and nitrogen retention very early in the illness, and it was considered inadvisable to administer more serum. All of the serum available to us contained 0.4 per cent phenol as a preservative. Since phenol might result in further impairment of renal function, it was our opinion that more serum should not be given to these 2 patients whose renal function was in a precarious state. These considerations show why in the 3 E cases less serum was administered than in the other cases in the study group. The question arises, however, whether more serum might not have lessened the severity of these 3 cases. In the other groups there was no obvious correlation between total amount of serum and clinical severity. Treatment with massive doses continued for several days did not seem to yield better results than the usual plan as described.

TABLE 7.—*Comparison of the Ages and Clinical Severity of 44 "Untreated" Patients* and 25 Serum Treated Patients**

Clinical Classification of Severity	Ages of the Patients in Each Classification					
	44 "Untreated" Patients			25 Serum Treated Patients		
	No. in Group	Individual Ages in Years	Average Age, Years	No. in Group	Individual Ages in Years	Average Age, Years
A	..	..	..	1	20	20
B	1	27	27	7	20, 23, 23, 26, 30, 30, 45	28
C	12	20, 20, 20, 21, 21, 22, 24, 25, 25, 26, 32, 47	25	8	19, 19, 20, 20, 21, 24, 26, 31	23
D	18	18, 20, 21, 21, 21, 22, 22, 22, 22, 23, 23, 25, 25, 27, 28, 29, 30, 32	24	6	19, 20, 20, 23, 30, 40	25
E	5	18, 19, 25, 35, 35	26	3	25, 25, 34	28
F	8	21, 26, 30, 30, 35, 36, 43, 46	33	0		

* Unvaccinated Egyptian men in the age group 18 to 48 admitted to the Commission ward in the first week of illness.

Contraindications to Serum Therapy.—A possible contraindication has been mentioned in the preceding paragraph, that is, the administration of large quantities of serum containing phenol or other preservatives which may exert a harmful effect on kidney function when oliguria and nitrogen retention have already made their appearance. The gravity of impaired renal function in the prognosis of typhus is discussed in a separate Typhus Commission report.[18] It is sufficient here to state that in our opinion phenol as a preservative should be avoided in the preparation of antityphus serum in view of the high incidence of impaired renal function in typhus.

COMMENT

The effect of hyperimmune antityphus rabbit serum in the treatment of typhus seemed to be very closely related to the duration of illness at the time treatment was first started. The results with 10 patients treated on the second and third day of the disease were almost uniformly good. When therapy was begun in the fourth, fifth and sixth days of illness it was more difficult to be certain that serum had influenced the course of the disease. To be sure there were no fatal cases, but a very much larger series of treated cases would be needed to prove that serum treatment did reduce mortality. If patients are first treated even later in

18. Yeomans, A.; Snyder, J. C.; Murray, E. S.; Ecke, R. S., and Zarafonetis, C. J.: Azotemia in Typhus Fever, to be published.

their disease than the sixth day, it is probable that the effect of serum would be impossible to evaluate except on a statistical basis.

What are the indications for the use of hyperimmune rabbit serum? The limited supply which is available at the present time precludes its use on a wide scale in an epidemic. Another therapeutic agent, para-aminobenzoic acid, has recently been reported to have a favorable influence on the course of typhus [19] and from the data available it seemed that para-aminobenzoic acid had a somewhat more definite effect in the fourth, fifth and sixth day cases than did the rabbit serum. Since para-aminobenzoic acid is far less difficult to obtain than the hyperimmune rabbit serum, the question arises whether serum treatment should be considered at any time. Its most logical use would be the treatment of medical and sanitary personnel who have been infected with typhus. Such patients are likely to come under medical observation very early in their disease, at the optimum time for serum treatment. However, the widespread use of killed rickettsial vaccines for medical and sanitary personnel is now entirely feasible, and recent experience with Cox type vaccine clearly indicates that the persons who contract typhus after the recommended course of vaccine [20] have a mild form of the disease. Up to the present time no proved fatal cases have occurred after the recommended vaccination. On the other hand, the mortality from typhus rises rapidly as the age of the patients increases. It would be overoptimistic to anticipate that vaccine will protect all persons in the age groups above 40 from a serious or even fatal outcome. In the case of medical or sanitary personnel older than 40 every possible attempt should be made to reduce the severity of the disease. The use of hyperimmune rabbit serum, particularly if the course of vaccination has been incomplete or not given at all, is certainly warranted for older patients, for whom it might prove to be a life saving measure.

SUMMARY AND CONCLUSIONS

Twenty-five patients with louse borne typhus were treated with refined and concentrated hyperimmune antityphus rabbit serum. Their clinical course was contrasted with that of 44 "untreated" cases.

The 10 patients who received serum in the first seventy-two hours of illness had mild uncomplicated typhus of short duration.

The 15 patients who had been sick for four, five or six days before serum was administered did not show a striking difference in clinical severity from the "untreated" controls, except that there were no fatal cases.

It is concluded that hyperimmune antityphus rabbit serum has a favorable therapeutic effect on the course of typhus if treatment is started in the first three days of the disease. Although serum treatment seemed to have reduced the mortality in the group of patients who received serum in the fourth, fifth and sixth days of illness, the value of serum therapy for late cases cannot be determined definitely from the data of this study.

19. Yeomans, A.; Snyder, J. C.; Murray, E. S.; Zarafonetis, C. J., and Ecke, R. S.: The Therapeutic Effect of Para-Aminobenzoic Acid in Louse Borne Typhus Fever, J. A. M. A. **126**: 349-356 (Oct. 7) 1944.

20. Ding, E.: Ueber die Schutzwirkung verschiedener Fleckfieberimpstoffe beim Menschen und en Fleckfieberverlauf nach Schutzimpfung, Ztschr. f. Hyg. u. Infektionskr. **124**: 670, 1943. Gilliam, A. G.: Report to the Director of the United States of America Typhus Commission, subject "Study of Typhus Vaccine at the Cairo Fever Hospital," Aug. 14, 1943. Ecke, R. S.; Gilliam, A. G.; Zarafonetis, C. J.; Yeomans, A.; Murray, E. S., and Snyder, J. C.: Paper in preparation. "Vaccination Against Typhus Fever, Cholera and Plague," circular letter No. 3, issued Jan. 14, 1942 by the Office of the Surgeon General, United States Army, Washington, D. C.

INTESTINAL PARASITE SURVEY OF REPATRIATES FROM THE FAR EAST

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There has been considerable speculation and perhaps unwarranted alarm concerning the probability of the importation of various parasites from the tropics into the United States during the postwar period, both by returning military personnel and by relocated civilian population groups. It would seem desirable, therefore, to survey representative groups of these individuals at convenient times and locations prior to their return to normal activities throughout the country in the post-war period.

Early in December 1943 the *Gripsholm* brought more than 1,000 Americans back to this country from the Far East. Among the passengers were several hundred missionaries with many years' residence in China, Japan, Korea and the Philippines. A considerable number of the passengers had been in Japanese occupied territory and in concentration camps for variable periods of time. Sanitary conditions were not always ideal, and opportunities for acquiring intestinal parasites were good.

It occurred to me that it might be profitable and interesting to carry out a survey on all the passengers when they arrived in New York City. Unfortunately, suitable arrangements for this could not be completed. However, by cooperation of several mission boards and many passengers who were canvassed by mail during their stay in New York, it was possible to obtain stool and blood specimens from 144 of the passengers.

PROCEDURE

Patients were requested to collect a casual stool specimen to be stored on ice and instructed to report for examination the following morning, immediately after having taken a saline cathartic (30 Gm. of sodium or magnesium sulfate). The precathartic specimens were stored in the ice box for subsequent study by the zinc sulfate centrifugal flotation method. Three post-cathartic specimens were collected and examined with saline solution and iodine as direct fecal films. In addition, these specimens were concentrated by zinc sulfate centrifugal flotation. Postcathartic specimens containing trophozoites of amebas were stained by Johnson's iron hematoxylin method for corroborative species identification.

Fresh fecal material was cultured on various selective mediums for pathogenic intestinal organisms. The parasitologic studies were conducted in the Tropical Diseases Diagnostic Laboratory of the New York City Health Department, and the bacteriology in the enteric laboratory.

RESULTS

Intestinal Parasites.—Seventy per cent of the passengers examined in this survey were found to harbor one or more intestinal parasites, protozoa or helminths, or both. The various parasites which were discovered, and their incidence are summarized in table 1.

From the Tropical Diseases Diagnostic Laboratories, New York City Health Department.

This study was begun and completed prior to the author's entrance into military service.

The author is assistant professor of preventive medicine and medicine, New York University College of Medicine, on leave of absence.

It is interesting to note that the infections by all the parasites encountered are of the "ingestion" type. The outstanding infection from the standpoint of potential human disease was from Endameba histolytica. Thirty-six persons, or 25 per cent of the entire group examined, were found infected with this protozoan parasite. Some of these passengers gave a history of known amebiasis, and some had gastrointestinal symptoms. All the casual stool specimens from the patients found to be infected with E. histolytica were formed. In 9 persons cysts were found before catharsis, and in 27 additional persons trophozoites or cysts or both were found after catharsis. Suitable treatment was advised in all cases.

It is well known that the efficiency of detecting the presence of infections with E. histolytica depends on the number and type of stools examined as well as on the technic, assuming that the examiner is well trained. Examinations of freshly passed postcathartic specimens will yield the greatest number of positives for any single method. Flotation with zinc sulfate will detect the highest number of positives for a single examination of a casual specimen as well as afford an opportunity of discovering helminth eggs or larvae. In the interest of convenience, speed and efficiency, we elected to combine these methods as originally mentioned. The results of these methods singly and in combination are outlined in table 2. If additional specimens had been examined at intervals of several days prior to catharsis, we undoubtedly would have detected a few more infections, raising our incidence to a theoretical value of 30 to 35 per cent for E. histolytica. However, in large surveys requiring speed and in which many specimens cannot be obtained, the method here employed is suggested.

The presence and the incidence of the other protozoa and helminths encountered is not surprising and is merely corroborative of the fact that raw foods and untreated water, when consumed in the Orient, are likely to convey protozoan and certain helminthic infections to man. On the other hand, it is interesting that there were no infections found from hookworms, strongyloides or schistosomes, despite residence in areas highly endemic for these parasites. This might be indicative that persons with a knowledge of the method of infection by these parasites (i. e. contact with infected soil or water) can exercise proper precautions to avoid exposure and subsequent infection. However, it is probable that numbers of persons will return with hookworms and schistosomes, particularly members of the military forces who may be exposed in highly endemic areas because of tactical dictates despite previous knowledge of the inherent dangers. The introduction of ancylostomes to the hookworm areas of this country may alter the present hookworm picture as it is clinically known in this country at the present time.

TABLE 1.—*Results of Stool Examinations from 144 Gripsholm Passengers*

	Number	Per Cent
Endameba histolytica	36	25.0
Endameba coli	67	46.5
Endolimax nana	13	9.0
Iodameba bütschli	8	5.5
Dientameba fragilis	3	2.0
Giardia lamblia	2	1.4
Chilomastix mesnili	2	1.4
Trichomonas hominis	42	29.23
Ascaris lumbricoides	17	11.8
Trichocephalus trichiurus	33	22.9
Enterobius vermicularis	1	0.7

Dysentery Organisms.—Stool cultures disclosed persons carrying shigella organisms. Two were Sonne and the rest atypical, that is, no reaction to Shiga, Flexner VWYZ, Sonne, Newcastle, Schmitz or alkalescens agglutinating serums. The patients had no symptoms referable to the gastrointestinal tract when interviewed, although some gave a history of dysentery previously. Our inability to identify the atypical organisms indicates that classifications used in New York City are not applicable to Far East strains.

TABLE 2.—*Comparative Value of Methods Employed in Detecting 36 Endameba Histolytica Infections Among 144 Gripsholm Passengers*

Method	Number Detected	Per Cent
A. Precathartic stool, zinc sulfate	9	25
B. Postcathartic stool, direct examination	29	80
C. Postcathartic stool, direct examination plus zinc sulfate	32	88
D. Combination of methods A, B and C	36	100

COMMENT

The type of parasites discovered in this survey are not foreign to this country. The incidence in this or similar groups is not greater than that known to occur in some areas of the United States. Unless the strains of Endameba histolytica are of unusual virulence and are disseminated through gross breakdowns of sanitary facilities there appears to be little danger in the introduction of a number of carriers to this country. However, it seems desirable in any clinical appraisal of a patient's complaints to do careful stool examinations if the person has been in the military forces or outside the continental United States. Food handlers who have had diarrhea or have served in the military forces or have been outside the United States should have stool cultures for Shigella and examinations for intestinal parasites. All infected persons should receive appropriate treatment to eliminate intestinal infections and should be instructed about care of the hands and fecal disposal, especially in rural areas. Surveys and treatment of men prior to release from military service will be helpful in reducing the carrier burden returning to civil life. Awareness of local health authorities and civil practitioners of medicine to the possibilities of intestinal or other parasitism will result in many instances in the recognition, control and elimination of such infections.

SUMMARY AND CONCLUSIONS

1. Among large groups of persons returning to this country after residence abroad, particularly poorly sanitated areas in the tropics, one can expect a considerable number to be infected with one or more parasites.

2. These parasites, for the most part, are not foreign to this country, and there is no basis for alarm about the spread of intestinal parasitic diseases in this country.

3. Surveys for intestinal infections should be carried out on representative groups returning to this country to detect carriers so they may be treated. Food handlers should receive special attention.

4. Physicians must consider the possibility of parasitism in evaluating patients' complaints and should resort to stool cultures and examinations for parasites routinely among persons who have served overseas.

5. Zinc sulfate flotation of a casual stool specimen in conjunction with direct examination and zinc sulfate flotation of freshly passed postcathartic specimens is a practical and efficient method for detecting a major number of intestinal parasitic infections in any survey.

Clinical Notes, Suggestions and New Instruments

ARTERIOVENOUS ANEURYSM

THE APPROACH TO THE INNOMINATE VESSELS

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Reports of successful treatment of lesions of the innominate artery are rare, particularly those that concern arteriovenous fistula. One of the main problems is the operative approach to the vessels which lie within the thoracic cage and which in the presence of a communication between them increase the difficulties of proper exposure because of the dilatation of the vessels and the increased collateral circulation always attendant on such a lesion. Most textbooks of surgery describe methods of exposure with a view of ligating the innominate artery by resection of the clavicle and disarticulation of its medial end. This has usually been done for aneurysm of the innominate artery in its terminal portion or as a preliminary to operations on the right subclavian and carotid vessels. This exposure is inadequate in the presence of an aneurysm or a fistula near the aorta. The constant danger of hemorrhage makes an adequate exposure imperative. Splitting the sternum to the third interspace and retraction of the divided portions, as is used in an approach to the thymus gland, would give good exposure, but in the presence of a fistula, with the danger of hemorrhage from dilated, thin-walled vessels, the approach described here is believed to be preferable.

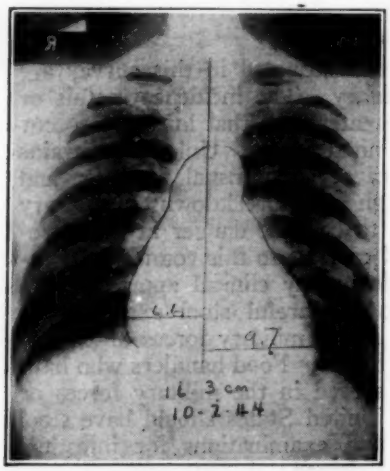

Fig. 1.—Cardiac dilatation eleven months after injury.

Arteriovenous fistula, innominate vessels, produced by stab wound Nov. 11, 1943. Resection of clavicle, second rib and cartilage. Division of sternum and partial resection. Proximal and distal ligation of innominate artery. Ligation and division of right innominate vein. Recovery.

A soldier aged 25 was stabbed in the right upper chest with sharp-pointed barber scissors on Nov. 11, 1943. There was considerable bleeding from the wound. He became unconscious and was treated for shock by plasma and blood transfusion. Four days later he had apparently recovered and was returned to duty, which he carried out without difficulty or complaint. In the course of an examination on April 1, 1944 a murmur was discovered in the anterior chest, and for this he was hospitalized and eventually transferred to Ashford General Hospital Nov. 6, 1944. He had no complaints except dyspnea on exertion.

There was a small healed wound on the anterior chest wall just below the right clavicle and 1 inch lateral to the sternal border. In this region there was a well defined continuous thrill, which was felt less distinctly in the neck and along the clavicle. A loud continuous murmur, intensified in systole, was audible. This was transmitted over the entire anterior chest and both shoulders and into both sides of the neck. It was heard over the back of the thorax. The blood pressure in the left brachial artery was 130/50 and in the right 140/40. The venous pressure in the left and right cubital veins was 210 mm. and 220 mm. of water respectively. The thrill and bruit could not be obliterated by pressure. A teleoroentgenogram of the heart on October 2 showed a transverse diameter of 16.3 cm. (fig. 1) and after a month of rest this decreased to 15.2 cm. (fig. 2).

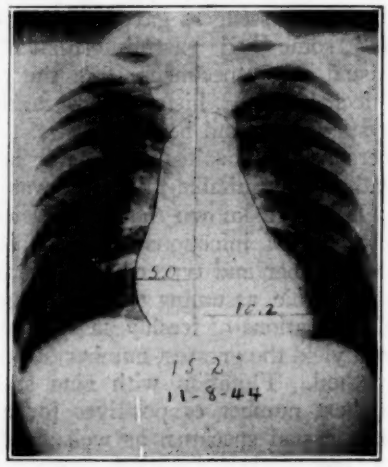

Fig. 2.—Reduction in cardiac size following one month of rest.

On Jan. 18, 1945 operation was performed. An incision beginning at the middle of the clavicle was carried medially to the sternum and downward to the fourth rib. The skin with the pectoral muscles was reflected laterally. The inner half of the clavicle was resected subperiosteally, disarticulating it at the sternoclavicular joint. The second costal cartilage and about 2 inches of the second rib were resected. By blunt dissection the space beneath the manubrium sterni was entered and the right portion of the manubrium was divided, leaving its connection with the first rib. A portion of the right half of the manubrium was removed with a rongeur. The pleura was dissected back by blunt gauze dissection from the midline under the sternum, and the first rib with the attached portion of the manubrium was retracted upward and outward (fig. 4). The internal mammary artery and vein, with their branches, were ligated and divided, and the fat and remains of the thymus were removed. This disclosed the innominate vessels. After considerable dissection a fistula was found to exist between the innominate artery and the two innominate veins at their point of junction just above the arch of the aorta. Both veins were greatly dilated, as was the artery proximal to the fistula, and in addition there was a false sac produced by local dilatation of the veins at the point of the fistula.

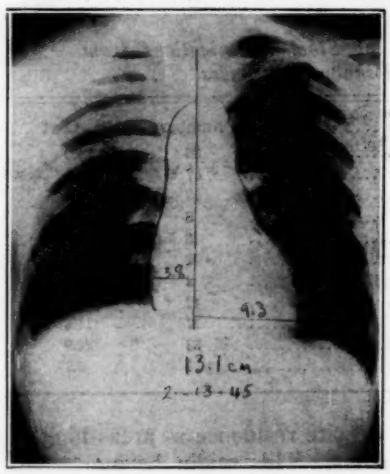

Fig. 3.—Return to normal cardiac dimensions one month after operation.

The right innominate vein distal to the fistula was ligated and divided. The false sac was separated from the aorta, to which it was firmly bound, and the innominate artery was

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doubly ligated at the point of its origin from the aorta. When this was done the thrill and bruit ceased completely. On ligation of the artery the pulse rate dropped from 84 to 72, and the blood pressure rose from 136/60 to 156/100. The innominate artery distal to the fistula was then doubly ligated (fig. 4). It was not thought feasible to ligate the left innominate vein or the superior vena cava. Complete excision of the fistula would have required ligation and division of both innominate veins, the superior vena cava and the innominate artery, and because of the fear of cerebral edema this procedure was not carried out. The operation was discontinued at this time with the hope of eliminating the fistula, since there are no branches of the innominate artery which might communicate with it.

The portion of the sternum with the attached first rib was replaced and sutured with two wires of tantalum (fig. 5). The musculocutaneous flap was replaced with interrupted sutures of silk. At the end of operation the pulse rate was 68 and

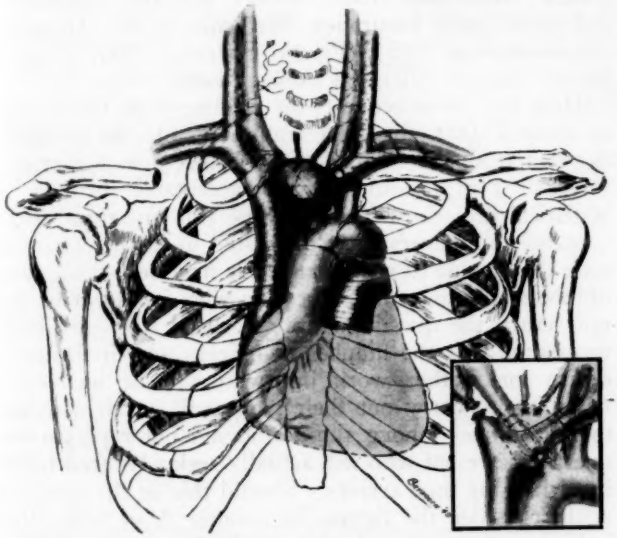

Fig. 4.—Arteriovenous fistula of the innominate vessels with false sac. Note resection of inner portion of clavicle and second rib, and retraction of the first rib with a portion of the sternum. Inset shows points of ligation and division of vessels.

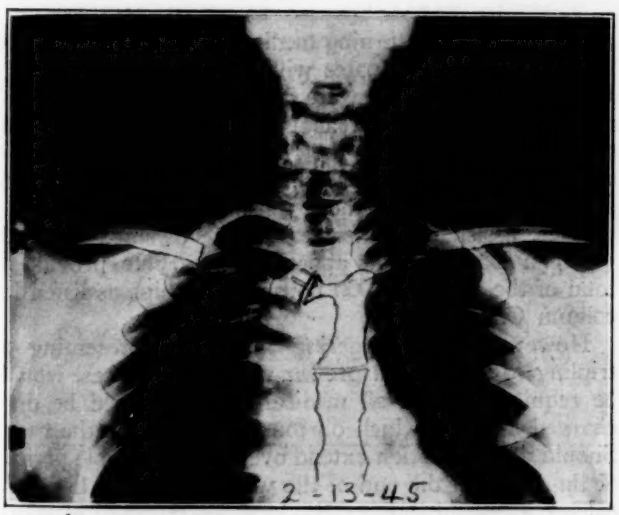

Fig. 5.—Postoperative appearance of chest (retouched).

the blood pressure 140/82. The operation required seven hours. The hand and fingers were warm at the end of the operation and have remained so. Recovery was uneventful except for an accumulation of blood beneath the pectoral muscles, which was removed by aspiration on three occasions. At no time during the patient's convalescence was the temperature elevated above normal, and the highest pulse rate was 100. Examination of the heart on Feb. 15, 1945 showed a transverse diameter of 13.1 cm., a reduction of 2.1 cm. (fig. 3). The venous pressure in the cubital veins on that date was 154 mm. of water on the left and 234 mm. on the right. There is no

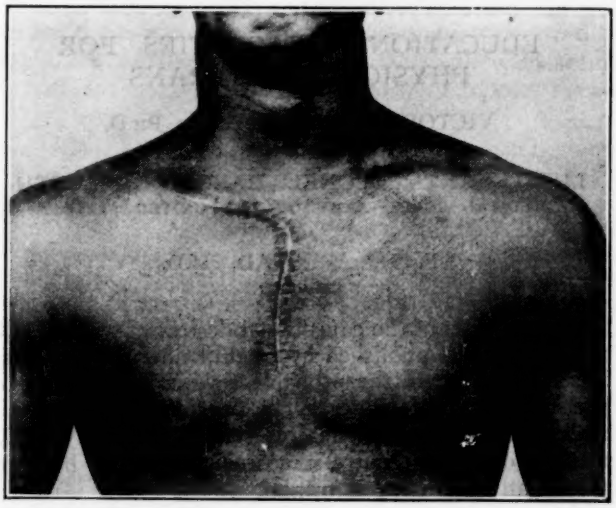

Fig. 6.—Patient six weeks after operation. Note line of incision and normal contour of chest.

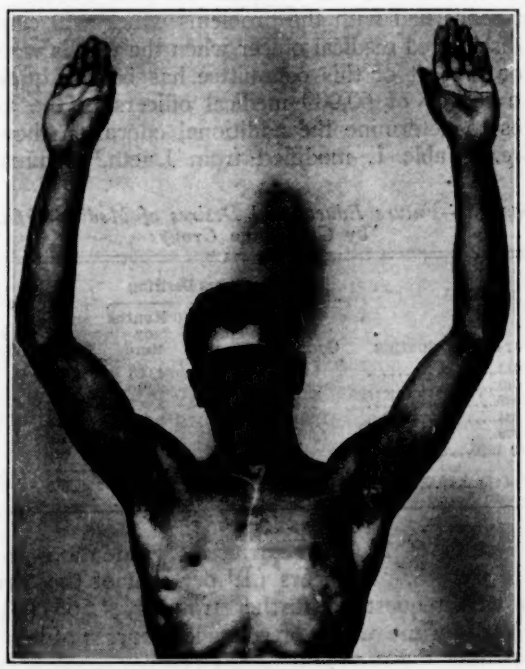

Fig. 7.—Nutrition and movement of the shoulder.

dysfunction of the hand, arm or shoulder movements (figs. 6 and 7). Examination on May 17 failed to reveal any bruit or thrill, and it is believed that the condition is cured.

Rectal Anesthesia.—The production of anesthesia by the intestinal route was attempted shortly after sulfuric ether became more generally available as an inhalation anesthetic agent. Apparently, Nikolas Iwanowitch Pirogoff, the famous Russian surgeon, first described this method in 1847. Sutton said that Pirogoff's original plan was to introduce liquid ether into the rectum. Magendie warned him that this might be a dangerous procedure. Pirogoff then devised a method of vaporizing the ether by heating it and administering it in its volatile form.—Keys, Thomas E.: The History of Surgical Anesthesia, New York, Schuman's, 1945.

Special Article

POSTWAR PLANNING

EDUCATIONAL FACILITIES FOR PHYSICIAN VETERANS

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The analysis of the educational desires of over 21,000 medical officers published by Lueth [1] now makes possible an estimate of the probable required expansion of present teaching facilities. The previous tentative estimates based on questionnaires returned by only 1,000 medical officers [2] require some revision on the basis of the greatly increased information.

EDUCATIONAL DESIRES OF MEDICAL OFFICERS AFTER DISCHARGE

The Committee on Postwar Medical Service [3] has been concerned with the problems which will confront the discharged medical officer when the war is won. A major project of this committee has been a questionnaire survey of 60,000 medical officers in the armed forces to determine the additional education they will desire. Table 1, modified from Lueth,[1] summarizes

TABLE 1.—*Future Educational Desires of Medical Officers by Graduation Groups*

Years of Graduation	Medical Officers Desiring: No Courses	Less Than 6 Months	6 Months or More	Totals	Percentage of 21,029 Replies
1941-1943	95	292	4,006	4,393	20.9
1938-1940	396	569	3,240	4,205	20.0
1935-1937	776	919	2,067	3,762	17.8
1930-1934	1,201	1,396	2,127	4,724	22.5
1920-1929	1,070	1,244	1,006	3,320	15.8
Before 1920	394	143	88	625	3.0
Totals	3,932	4,563	12,534	21,029	100.0

the results of 21,029 returns by graduation groups. There were 3,932 officers (19 per cent of those replying) who request no further training, 4,563 (21 per cent) who want review or refresher courses of less than six months' duration and 12,534 (60 per cent) who will seek work of six months or more, primarily in residency-type house officerships.[4] In general, most of those in the older age groups expect either no further training or review and refresher courses lasting less than six months. The more recent graduates are primarily interested in hospital work of six months or more. These findings were to be expected, although the large total numbers desiring advanced medical education, especially for the longer period, could not have been anticipated without the information received directly from the officers themselves.

HOUSE OFFICERSHIPS

In table 2 are analyzed the 12,534 requests for residency-type training in the various fields of medicine listed. About 70 per cent of the officers wanting training of more than six months' duration will seek it in the following four fields: Surgery and its subspecialties (3,497), Internal Medicine and its subspecialties (2,519), Obstetrics and Gynecology (1,353) and General Review (1,351). The fields indicated by the fewest (less than 100) officers are the following: Industrial and Insurance Medicine (14), Hospital Administration (15), Plastic Surgery (75), Neurological Surgery (76) and Public Health (87).

How may these requests for training from the replies of about 21,000 officers be translated into the probable demand from the total of 60,000 officers in the armed forces? There is no generally acceptable formula or statistical procedure for answering this question. Presumably the officers most interested in further training took the trouble to reply, but there may be considerable numbers wanting more education who could not or did not return the questionnaire. Perhaps it is justifiable to assume that the number of officers who indicated a desire for further work but who will be unable or unwilling to carry out their plans will be about equal to the number among those who did not reply to the questionnaire but who will actually seek advanced training when the time arrives. Should this be the case, we could consider the figures in column A of table 2 to indicate the approximate total house officerships required in all fields to meet the needs of all medical officers in all services on their separation from active duty.

REQUIRED EXPANSION OF EXISTING FACILITIES

In addition to returning medical officers, new generations of civilian graduates will seek advanced training. In the year 1941 there were 5,256 residents in the various fields of medicine, as indicated in column B of table 2. Together with the 12,534 medical officers, this totals 17,790 house officerships (column C) required after the war. Since there were 5,796 approved residencies, assistant residencies and fellowships in 1943 (column D), it might appear necessary to provide a total of the nearly 18,000 house officerships as listed in column C.

However, this staggering number, representing a tripling of the normal prewar number of places, would be required only if all medical officers should be discharged at once, which obviously will not be the case. Should demobilization extend over an appreciable period of time beyond the end of the war, the figures listed in column F would indicate the facilities required in addition to those now available. This expansion requires approximately a doubling of the existing house officer positions. In column G is estimated the per cent expansion required in all the fields of medicine.

Some of these percentages of column G may be misleading. The 458 per cent expansion required in General Review courses does not take into account that 721 civilian hospitals now approved for internships are

This report is based on studies by the Council on Medical Education and Hospitals of the American Medical Association and the Committee on Postwar Medical Service.

1. J. A. M. A. **127:** 759 (March 31) 1945.
2. J. A. M. A. **126:** 253 (Sept. 23) 1944.
3. The Committee on Postwar Medical Service was organized by the American Medical Association in collaboration with the American College of Physicians and the American College of Surgeons. In addition, it includes representatives of the Association of American Medical Colleges, the Surgeons General of the Army, Navy and Public Health Service, the Veterans Administration, the Federation of State Medical Boards, the American Hospital Association, the Catholic Hospital Association, the Procurement and Assignment Service and the Advisory Board for Medical Specialties.
4. It cannot be assumed that these proportions will apply to all 60,000 medical officers. See discussion in the adjoining column.

also approved for mixed residencies. These plus the 154 mixed residencies in approved hospitals should be ample to provide for the additional 705 places required for General Review residencies or "second year" internships. The 650 per cent increase indicated in Plastic Surgery must be qualified by the fact that the number of places required is small: only about 39 additional openings seem to be needed.

of officers (1,946) failed to specify the field in which they intend to qualify for certification. The smallest numbers (about 200 or less in each field) aim at certification in Neurologic Surgery (80), Plastic Surgery (93), Pathology (201) and Anesthesiology (207). Since there were even more officers who stated that they want certification (13,333) than will want training of six months or more (12,534), it follows that a

TABLE 2.—*Estimated Additional Postwar House Officerships Required*

	Column A	B	C	D	E	F	G
Field in Which Training Is Desired	Estimated House Officerships Required by All Medical Officers	Normal Prewar Numbers: Assistant Residents, Residents and Fellows in 1941 [1]	Estimated Total Postwar House Officerships Required (A Plus B)	Approved Residencies, Assistant Residencies and Fellowships in 1943 [2]	Estimated Additional Postwar Facilities Required if Demobilization Occurred at Once (C Minus D)	Estimated Additional Facilities Required if Demobilization Extends Over a Period of Time: Number of House Officerships (A/2 + B − D)	Estimated Additional Facilities Required if Demobilization Extends Over a Period of Time: Per Cent Increase Above 1943 Facilities Shown in Column D
Anesthesiology	156	121	277	128	149	71	55
Dermatology and Syphilology	225	78	303	82	221	108	132
General Review	1,351	183	1,534	154	1,380	705	458
Hospital Administration	15	...	15	...	15	7	...
Industrial and Insurance Medicine	14	...	14	...	14	7	...
Internal Medicine and Subspecialties	2,519	1,131	3,650	1,302	2,348	1,089	84
Neurological Surgery	76	36	112	60	52	14	23
Obstetrics and Gynecology	1,353	442	1,795	504	1,291	615	122
Ophthalmology	411	208	619	242	377	172	71
Orthopedic Surgery	487	200	687	243	444	201	83
Otolaryngology	362	233	595	229	366	185	81
Pathology	210	332	542	311	231	126	41
Pediatrics	497	393	890	389	501	253	65
Plastic Surgery	75	8	83	6	77	39	650
Psychiatry and Neurology	502	497	999	548	451	200	36
Public Health	87	...	87	...	87	43	...
Radiology	373	250	623	281	342	155	55
Surgery and Subspecialties	3,497	1,007	4,504	1,161	3,343	1,595	137
Urology	255	137	392	156	236	108	69
Other Fields	69	...	69	...	69	34	...
Totals	12,534	5,256	17,790	5,796	11,994	5,727	99

1. J. A. M. A. **116**:1070 (March 15) 1941. 2. J. A. M. A. **122**:1119 (Aug. 14) 1943.

Apart from these two special cases the fields requiring more than twice the 1943 facilities are Surgery and Subspecialties (137 per cent expansion), Dermatology and Syphilology (132 per cent) and Obstetrics and Gynecology (122 per cent). Internal Medicine and Subspecialties, involving large numbers of individuals, will require some 84 per cent increase in 1943 house officerships.

The least expansion of residency places would seem to be indicated in Neurological Surgery (23 per cent), Psychiatry and Neurology (36 per cent), Pathology (41 per cent), Anesthesiology (55 per cent) and Radiology (55 per cent).

SPECIALTY CERTIFICATION BY THE AMERICAN BOARDS

Since over 10,000 medical officers will seek residencies in definite specialties after the war, it is of interest to estimate the number of medical officers who intend to seek board certification. These figures are given in table 3, derived from Lueth's studies. The first column shows the numbers of physicians certified by the various American boards to March 1, 1945, the total being 24,752. In the second column are tabulated the numbers of officers who state that they will seek certification, totaling 13,333. Over half of these (56 per cent) expect to qualify for the American Boards in Surgery (3,450), Internal Medicine (2,644) and Obstetrics and Gynecology (1,368). A large number

goodly number of them already have considerable credit toward the requirements of the boards.

Should these projected certifications be consummated, there will be a decided increase in the number of

TABLE 3.—*Specialty Certification by the American Boards*

	Physicians Certified to March 1, 1945*	Medical Officers Desiring Future Certification
Anesthesiology	249	207
Dermatology and Syphilology	710	258
Internal Medicine and Subspecialties	3,541	2,644
Neurological Surgery	163	80
Obstetrics and Gynecology	1,871	1,368
Ophthalmology	2,437	433
Orthopedic Surgery	896	521
Otolaryngology	3,848	412
Pathology	1,047	201
Pediatrics	2,318	522
Plastic Surgery	161	93
Psychiatry and Neurology	1,899	535
Radiology	2,095	376
Surgery and Subspecialties	2,499	3,450
Urology	1,018	287
Field Not Specified		1,946
Totals	24,752	13,333

* J. A. M. A. **128**: 129 (May 12) 1945.

specialists in the next few years. It is beyond the scope of this paper to venture an estimate of the consequences of this trend on medical practice and care in this country or to conclude whether the trend should be encouraged or discouraged.

REVIEW AND REFRESHER COURSES

In table 4 is given a further analysis of the desires of medical officers compared with the facilities available for review and refresher courses of six months or less in duration. Included in this group are 860 officers who will want courses of three months or less in duration. Various educational institutions in the year 1943-1944 provided 233 such courses for 26,359 physicians in the various fields indicated. In virtually every specialty it would appear, on superficial examination, that existing facilities might perhaps meet the demands of the returning medical officers in these shortest courses. However, a word of caution is necessary. On the one hand, many of the 860 officers may wish training of nearly three months' duration. On the other hand, over 92 per cent of the physicians enrolled in the very short 1943-1944 courses attended for about two months or less and over 90 per cent of them were in courses of about one month or less.[2] It is likely that a considerable increase in facilities will be required in courses of about three months' duration, especially in Internal Medicine (with 207 requests for training), Surgery and Subspecialties (134 requests), General Review (96), Obstetrics and Gynecology (88) and Pediatrics (88).

TABLE 4.—*Full Time Review and Refresher Short Courses—Less Than Six Months*

	Three Months or Less Duration			Three to Six Months Duration			Duration Varies or Not Stated			Totals		
	Courses Given 1943-1944		Medical Officers Requesting Training	Courses Given 1943-1944		Medical Officers Requesting Training	Courses Given 1943-1944		Medical Officers Requesting Training	Courses Given 1943-1944		Medical Officers Requesting Training
Field of Training	Number	Physicians Attending		Number	Physicians Attending		Number	Physicians Attending		Number	Physicians Attending	
Anesthesiology	3	534	13	1	6	44	1	5	35	5	545	92
Dermatology and Syphilology	3	55	16	..	..	47	10	41	42	13	96	105
General Review	26	2,385	96	..	..	294	5	73	220	31	2,458	610
Hospital Administration	..	.....	...	..	..	5	..	...	25	...	.....	30
Industrial and Insurance Medicine	..	.....	2	..	..	2	..	...	17	...	.....	21
Internal Medicine and Subspecialties	97	19,651	207	7	44	518	7	79	308	111	19,774	1,033
Neurological Surgery	..	.....	3	..	..	7	..	...	7	...	.....	17
Obstetrics and Gynecology	16	151	88	1	8	212	..	...	140	17	159	440
Ophthalmology	21	320	57	2	33	80	..	...	58	23	353	195
Orthopedic Surgery	3	14	20	..	..	43	..	...	61	3	14	124
Otolaryngology	13	131	51	3	10	81	2	7	86	18	148	218
Pathology	..	.....	10	1	7	23	2	25	27	3	32	60
Pediatrics	12	291	88	..	..	138	..	...	60	12	291	286
Plastic Surgery	..	.....	4	..	..	18	..	...	26	...	.....	48
Psychiatry and Neurology	7	1,073	19	..	..	69	8	182	70	15	1,255	158
Public Health	..	.....	..	..	..	10	..	...	13	...	.....	23
Radiology	4	38	25	..	..	61	2	16	50	6	54	136
Surgery and Subspecialties	25	1,708	134	1	10	350	1	1	346	27	1,719	830
Urology	3	8	22	..	..	49	..	...	37	3	8	108
Other Fields	..	.....	5	..	..	11	..	...	13	...	.....	29
Totals	233	26,359	860	16	118	2,062	38	429	1,641	287	26,906	4,563

The statistics in table 4 indicate clearly that there must be an extensive organization of courses lasting from three to six months. Although in 1943-1944 only sixteen such courses were given to 118 physicians, there are 2,062 medical officers who will want work of this duration. The greatest numbers want training in Internal Medicine (518), Surgery (350), General Review (294) and Obstetrics and Gynecology (212). The greatest numbers of men who failed to specify the duration of their anticipated courses (totaling 1,641) also indicate an interest in further education in just these four fields.

Meeting this demand for courses of about three to six months' duration is primarily the responsibility of the medical schools, the medical school hospitals, institutions with well organized postgraduate medical courses, and the larger clinics and hospitals. Externships and courses similar to those projected by the University of Wisconsin[5] and Northwestern University[6] are being developed by a number of schools. Semiannually the Council on Medical Education and Hospitals of the American Medical Association compiles and publishes a list of continuation courses for practicing physicians. The most recent publication[7] is entitled "Postgraduate Continuation Courses for Veteran and Civilian Physicians" and includes numerous courses especially designed for physician veterans. This listing is the longest ever published by the Council and represents a wide range of subject matter and a broad geographic distribution. This is the first list to be published to meet the needs of returning medical officers. It is hoped that by the end of this year many more courses will have been organized especially for veterans, which can be included in the next published compilation of courses for veterans and other physicians scheduled for late December 1945 or early January 1946.

In planning review and refresher courses, the following should be borne in mind: (*a*) Refresher courses in the fields of Internal Medicine, Surgery, General Review, Obstetrics and Gynecology and Pediatrics are especially needed; (*b*) these should be courses of about three to six months' duration; (*c*) courses should be organized to start as soon as there is an enrolment of ten or fifteen, for example; (*d*) veterans should not have to wait unduly long to commence the work, so that programs permitting enrolment each month are desirable; and (*e*) plans should be based on the justifiable assumption that most of the medical school faculties now in service will be released by the time the peak demand for review and refresher courses is reached.

5. Circular, "Postgraduate Medical Courses," the University of Wisconsin Medical School.
6. J. A. M. A. **127**: 741 (March 31) 1945.
7. J. A. M. A. **128**: 751 (July 7) 1945.

EXPANSION OF HOUSE OFFICERSHIPS

In collaboration with the Committee on Postwar Medical Service, the Council on Medical Education and Hospitals of the American Medical Association has circularized all the 1,054 civilian hospitals now approved for internships and residencies to ascertain the extent to which their facilities would warrant increases in numbers of residents in already approved residencies and the organization of new residencies in fields not now approved. The results to date, given in table 5, are most encouraging.

Replies from 292, or 28 per cent, of the hospitals indicate that they believe they can provide 2,382 additional residencies, which is 42 per cent of the estimated 5,727 additional residency positions required. Of these new residency places, over two thirds have already been surveyed by the Council staff and have been approved both by the Council and by the American board concerned. This means that there is already a large number of fully approved openings available for returning medical officers. Less than one third of the places are in new residencies yet to be approved in hospitals already approved for internships and/or residencies in some other field. Surveys of the hospitals involved will be carried out well in advance of the peak of demobilization and the demand for residencies. See page 55 of this issue for further discussion.[8]

TABLE 5.—*Expansion of Residencies in 292 of the 1,054 Civilian Hospitals Approved for Internships and/or Residencies*

Field of Training	Estimated Additional Requirement (2 Year Demobilization)	Additional Available in 292 Hospitals
Anesthesiology	71	102
Dermatology and Syphilology	108	54
General Review	705	77
Hospital Administration	7	..
Industrial and Insurance Medicine	7	..
Internal Medicine and Subspecialties	1,089	457
Neurologic Surgery	14	40
Obstetrics and Gynecology	615	209
Ophthalmology	172	77
Orthopedic Surgery	201	107
Otolaryngology	185	87
Pathology	126	127
Pediatrics	253	143
Plastic Surgery	39	17
Psychiatry and Neurology	200	258
Public Health	43	..
Radiology	155	133
Surgery and Subspecialties	1,595	416
Urology	108	78
Other Fields	34	..
Totals	5,727	2,382

The statistics in table 5 would seem to indicate that, if all the residencies planned by the hospitals which have now reported are acceptable to the Council and the boards, the needs of the returning medical officers have already been practically provided for in Anesthesiology, Neurological Surgery, Pathology, Psychiatry and Neurology, and Radiology. This table also indicates that there is little doubt that the required facilities will probably be provided without too much difficulty in most other fields, if planning continues as earnestly as it has commenced.

At the residency level it would appear that provisions for training in Surgery will require further careful consideration, because of the large numbers involved. In this field it is especially important that the following devices be employed to increase the number of places available: (*a*) affiliation of approved hospitals with hospitals which, although not approved for full residencies, seem able to provide some acceptable training, under the supervision of the approved hospital; (*b*) affiliation of hospital training programs with high grade board-certified surgeons in private practice, on a preceptor basis; (*c*) assignment of surgical residents to work in related fields in which the demand for additional house officerships will not be as great, such as Pathology and Radiology, and (*d*) assignment of residents to work in applied basic sciences.

In September 1945 the Council on Medical Education and Hospitals of the American Medical Association will publish its annual compilation of approved internships and residencies. This list will indicate the expanded number of places provided by those hospitals already approved for such training. This will be the first up-to-date listing of residency facilities for returning medical officers as well as other physicians.

ARMY AND NAVY EDUCATIONAL PROGRAMS

The armed forces have recognized the necessity for engaging in educational programs, especially for those younger officers whose assignments have necessarily been relatively nonprofessional or at least not such as would contribute materially to the officer's educational armamentarium in medicine. The need for such training is recognized by the Surgeons General, not only for the good of the officer himself but also because experience has amply demonstrated that medical care is improved in institutions and installations conducting educational programs. This applies to civilian and military hospitals alike.

The Navy and the Army Air Forces have concentrated primarily on hospital residencies. These have been and are being developed in close collaboration with the Council on Medical Education and the American boards. The aim is to organize residencies of sufficiently high caliber to diminish the load on civilian hospitals after the war. After inspection and consultation services by the Council, it is anticipated that numerous Air Force and Navy residencies will be added to the list of Council approved and Board acceptable residencies, to be published in revised form in September.

The Army is now engaged in organizing refresher and review courses of three months' duration. A further account of this program, as well as the house officerships of the Navy, appears elsewhere in this issue of THE JOURNAL.[9]

THE G. I. BILL OF RIGHTS

The educational benefits of the G. I. Bill of Rights (Public Law 346) as applied to physician veterans have been described in a previous publication.[10] In summary, it may be said that (*a*) medical schools and hospitals are included as eligible for certification as educational institutions under this act, (*b*) approved hospitals are entitled to tuition benefits ($500 per academic year of nine months) even if tuition has not customarily been charged in the past, provided the hospital can show that tuition is warranted on the basis of the costs of the educational program, (*c*) this tuition stipend may in turn be added to other stipends offered to the house officer if the hospital chooses, (*d*) the resident is eligible to receive his allowance under the G. I. bill, even if he is paid a stipend by the hospital, and (*e*) there will be a very liberal interpretation of the "interruption of training" provision of the law for men over 25 years of age.

8. Approved Internships and Residencies for Veteran and Civilian Physicians.

9. This issue, p. 37.

10. J. A. M. A. **126**: 709 (Nov. 11) 1944.

SUMMARY

1. Approved residencies in the specialties will have to be approximately doubled in number to meet the needs of physician veterans and new generations of medical graduates.

2. It is incumbent on hospitals and medical schools to effect this increase by expanding the places available in existing approved residencies, and by developing new residencies where the educational facilities seem to warrant it.

3. Hospitals approved for residencies should affiliate with such hospitals as seem capable of organizing some acceptable work under the direction of the approved institution, which might then rotate its residents through the affiliated hospital for a limited period of time.

4. To date, 28 per cent of the approved hospitals have indicated that they think they can provide 42 per cent of the increased number of residencies needed after the war. Two thirds of these places have already been approved by the Council on Medical Education and Hospitals of the American Medical Association.

5. The number of medical officers who state they will seek specialty board certification is over one half the number who have already been certified.

6. In addition to the continuation courses now available to physicians, there is a need for a considerable number of full time review and refresher courses of about three to six months' duration. Several medical schools have already organized such facilities.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

YEAST EXTRACT CONTAINING VITAMIN B COMPLEX (See New and Nonofficial Remedies, 1944, p. 606).
The following dosage form has been accepted:

MCNEIL LABORATORIES, INC., PHILADELPHIA

Brewers' Yeast Tablets: 0.32 Gm. Each tablet contains brewers' yeast 0.32 Gm., providing thiamine hydrochloride 0.167 mg. (55.5 U. S. P. units), riboflavin 0.023 mg. and niacin 0.195 mg.

Preparation.—

Dried Brewers' Yeast—U. S. P.—Granulated with a mixture of calcium carbonate, starch, sodium chloride, dried malt syrup, saccharin, vanillin, oil of chocolate and talc. The mixture is compressed into tablets.

PENICILLIN (See the Supplement to New and Nonofficial Remedies, 1944, p. 18).
The following dosage form has been accepted:

WILLIAM R. WARNER & CO., INC., NEW YORK

Penicillin Sodium: 100,000 Oxford Unit ampuls.

HEXESTROL (See THE JOURNAL, Dec. 9, 1944, p. 961).
The following additional dosage form has been accepted:

THE WM. S. MERRELL COMPANY, CINCINNATI

Solution Hexestrol in Oil 5 mg. per cc.: 20 cc. ampuls. Preserved with 0.5 per cent chlorobutanol.

RIBOFLAVIN (See New and Nonofficial Remedies, 1944, p. 613).
The following dosage form has been accepted:

LAKESIDE LABORATORIES, MILWAUKEE

Tablets Riboflavin: 5 mg.

CONTRACEPTIVE DIAPHRAGMS (See New and Nonofficial Remedies, 1944, p. 340).
The following product has been accepted:

CONTRA CREME AND DIAPHRAGM CO., SEVERNA PARK, MD.

U. S. trademark 355,838.

Contra Diaphragm: Latex rubber diaphragm covering a spiral spring, the external diameter varying in gradations of 5 mm. from 50 to 95 mm.

Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following report. HOWARD A. CARTER, *Secretary.*

MAICO TYPE K VACUUM TUBE HEARING AID ACCEPTABLE

Manufacturer: Maico Company, Inc., 21 North Third Street, Minneapolis.

The Maico Type K is a three tube vacuum tube instrument consisting of a transmitter and amplifier case, a battery unit and an air or bone conduction reproducer.

Physical dimensions: Case: 4⅝ inches by 2⅜ inches by 15/16 inch; 45 volt B battery: 3 15/16 inches by 2 inches by 1⅜ inches; 1½ volt A battery: 3 13/16 inches by 1 1/16 inches (rod shaped).

Maico Hearing Aid Type K.

Weight: Transmitter and amplifier case, 7 ounces; 45 volt B battery, 9 ounces; 1½ volt A battery, 4 ounces; total weight of instrument, 20 ounces.

Current consumption: A battery, 70 milliamperes at 1.5 volts; B battery, 1.7 milliamperes (with 1.5 volt A battery). The current drain is independent of the volume control setting.

Acoustical gain for speech: With large crystal receiver (1 inch diameter) and full volume, 45 decibels. This gain represents the average gain for three individuals, each of whom had losses of from 40 to 50 decibels for air conduction from 256 to 2,048 cycles. These individuals perceived speech through a high quality sound reproduction system at an average level of 45 decibels less intensity with the hearing aid than without it.

Acoustical gain for pure tones:

Frequency:	250	500	1,000	2,000	3,000	4,000	5,000
Full gain in decibels	29	32	45	56	47	33	17

These values were obtained with the large size crystal receiver, the tone controls being adjusted for maximum low and maximum high frequency response. The measurements were obtained with an artificial ear. The hearing aid was mounted on a body baffle.

Physical and mechanical features: The transmitter and amplifier case consists of a rectangular black plastic case of pleasing and more or less conventional design. A combined volume control and on-off switch, a round knurled molded plastic wheel, is conveniently located on the top of the case. The high frequency tone control adjustments are made by the insertion of small screws in the back of the instrument and the low compensation by the insertion of screws in the front of the chassis, accessible only by taking apart the case. The instrument has both high and low impedance output, enabling one model to be used with crystal or magnetic air conduction receivers or with high or low impedance bone conduction reproducer.

Performance: The instrument operates in an entirely satisfactory manner. There is a minimum of inherent amplifier, case and cord noise. The frequency compensation controls perform as represented.

Recommendations: The Council on Physical Medicine voted to include the Maico Type K Vacuum Hearing Aid in its list of accepted devices.

MEDICAL EDUCATION IN THE UNITED STATES AND CANADA

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EDUCATIONAL PLANS FOR RETURNING PHYSICIAN VETERANS

This series of articles presents concise descriptions of specific plans for meeting the educational needs of returning medical officers. It is hoped that these concrete programs will assist and perhaps guide other postwar planning groups such as medical schools, medical societies, specialty boards, foundations and other organizations, some of which may not yet have completed their plans for meeting this urgent need in medical education.

These brief articles on typical plans do not constitute a comprehensive coverage of the many definitive projects under way throughout the country. Such coverage is attempted elsewhere in this issue (see page 28) and more fully in other recent publications of the Council on Medical Education and Hospitals of the American Medical Association.[1]

While the army and navy educational programs are for medical officers still on active duty, descriptions of them are included in this series because many of the officers benefiting from this work may soon return to civilian practice. Thus such programs for officers in service will supplement the projects of civilian institutions and organizations which seek to provide educational facilities for physician veterans.

THE PLAN IN NORTH CAROLINA

Wilburt C. Davison, M.D.
Dean, Duke University School of Medicine

All veterans, regardless of the age at which they entered the service and whether or not they had been in practice, are eligible under the G. I. Bill of Rights for a retraining course of one year at any institution approved by the Veterans Administration, which will pay fees to the institution up to $500 per year and a subsistence allowance of $50 monthly to the veteran; $75 if he has a dependent. On completion of this one year course, veterans who entered the service under 25 years of age and those, regardless of age, who can show that their training was impeded or interrupted by their entrance into the service also are entitled to additional training of the same number of months they have been in the service. In other words, a medical officer who has been in the armed forces for thirty months and entered the service at the age of 25 years or, regardless of age, had been an intern or resident but had not completed his resident training is eligible for three and one-half years of postwar training, i. e. one year plus thirty months.

Medical officers are of four groups: (*a*) former general practitioners, (*b*) ex-interns with nine to twelve months of training, (*c*) ex-residents with eighteen to thirty-six months of hospital experience and (*d*) former specialists. It is impossible to foretell accurately how many of the returning ex-interns and ex-residents will want exclusive training in the specialties, but it is hoped that many of them will decide to go into general practice, in which they are greatly needed. All but 15 per cent of patients can and should be handled by general practitioners, yet the results of the recent poll of the armed services indicated that more than 50 per cent of the medical officers intended to specialize on their return. Obviously there must be a variety of possibilities, which will provide whatever type of training the returning medical officer desires. The plan presented here will be followed by the medical schools of Duke and North Carolina universities, the Bowman Gray School of Medicine of Wake Forest College and the cooperating North Carolina hospitals.

1. Postgraduate Continuation Courses for Veteran and Civilian Physicians, J. A. M. A. **128:** 751-761 (July 7) 1945.
Approved Residencies and Fellowships for Veteran and Civilian Physicians (to be published).
Lueth: Postgraduate Wishes of Medical Officers **127:** 759-770 (March 31) 1945.
Johnson, Lueth and Arestad: Educational Facilities for Physician Veterans, this issue, p. 28.

Refresher or brush-up courses can be given at Duke and the Bowman Gray School of Medicine of Wake Forest College for the former practitioners by appointing additional instructors in medicine, pediatrics and obstetrics, at each of the two schools. It is realized that refresher courses are the least satisfactory method of postgraduate education. However, many of the medical officers who have been in practice may wish to return to their homes as quickly as possible to start rebuilding their incomes, so these refresher courses may have to be arranged in repeated short doses, emphasizing the recent medical advances, to accommodate the physicians who can spare only a week or two at a time.

The ex-interns and ex-residents, as well as some of the former general practitioners, may wish three to twenty-four months of hospital training in the specialties, and additional residencies will be provided. For example, the North Carolina teaching hospitals had six prewar approved pediatric residencies, but arrangements have been made with the pediatricians in the other hospitals for ten additional pediatric residents. Under this plan the hospitals can appoint sixteen residents instead of the usual six, each of whom would spend three to six months at one or more of these hospitals under the supervision of a licentiate of the American Board of Pediatrics, thereby obtaining a broader training than would be possible in one institution. A similar program has been planned in the other specialties and combinations of specialties. If the returning medical officers who have families prefer these residencies as externships, they will be arranged.

Hospital experience and tutoring for the former specialists can be easily arranged with the licentiates of the various specialty boards. The experience of working in a busy specialist's office should greatly help these returning officers to bring their knowledge up to date.

In addition, training will be provided at the three North Carolina medical schools in the basic medical sciences—anatomy, biochemistry, physiology, pharmacology, bacteriology and pathology—for at least three reasons: first, the requirements of the specialty boards must be satisfied; secondly, the practitioner needs this training to help him improve his practice of medicine, and finally it is highly desirable to encourage some of the returning medical officers to become teachers in these subjects, in which they are greatly needed if good teaching and high research levels are to be maintained after the war.

All plans must be modifiable to accommodate for the wide range in the returning medical officers' prewar status, their variety of war experiences—field or hospital duty—and their rate of demobilization. For example, some of the ex-interns and ex-residents who return each year may elect to specialize in pediatrics and desire one or more years of pediatric residency, while others may want to become general practitioners and need only refresher courses in pediatrics, obstetrics and medicine. This plan is flexible enough to fit these various needs and can be started tomorrow morning or at any time a medical officer returns. Further information can be obtained by writing to the deans of the University of North Carolina School of Medicine, Chapel Hill, N. C., of the Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, N. C., and of Duke University School of Medicine, Durham, N. C., or to the Postwar Planning Committee of the Medical Society of the State of North Carolina, Box 3701, Durham, N. C.

REVIEW AND REFRESHER COURSES

Ovid O. Meyer, M.D.
Professor of Medicine, University of Wisconsin Medical School

The University of Wisconsin Medical School has four plans for meeting the desires and needs of physicians returning from military service. Particular emphasis is to be placed on a review and refresher course of twelve weeks' duration. This course is planned especially for returning general practitioners and has the purpose of review and study of the recent advances in the major fields of medicine. Four weeks will be devoted to medicine (including a week of neuropsychiatry), four weeks to general surgery and allied specialties, two weeks to pediatrics and two weeks to obstetrics and gynecology.

This course will consist of ward rounds, instruction in basic sciences with clinical application, clinics, lectures, conferences and round table discussions. Instruction hours will be from 8 a. m. to 12 noon and from 2 to 5 p. m. daily (Saturday afternoons excluded). This course will be limited to twenty, with a minimum of ten. The first session will be offered when ten enrollees are registered with the dean of the Medical School and the course will be repeated each three months while the demand exists. The instructors in this course will be those of professorial rank on the full time or part time staff of the Medical School. The practical will be emphasized.

The course for medicine (after rounds from 8 to 11 each morning) will include three weeks covering advances in laboratory medicine and clinical biochemistry, cardiovascular physiology, allergic diseases, malaria, chemotherapy, nutrition, common skin diseases and proctoscopy. Extended discussions and clinics covering the blood dyscrasias and hemorrhagic diseases, diseases of the gastrointestinal tract and jaundice, renal diseases, tuberculosis, hypertension, cardiovascular diseases and endocrine dysfunctions will be a part of the course.

The subjects to be covered in the week of medicine devoted to neuropsychiatry are the neurologic examination, neuroanatomy, cerebral apoplexy, subarachnoid hemorrhage, traumatic lesions, polyneuritis, basal ganglions, central nervous system tumors, central nervous system syphilis, diagnostic procedures, discussions on the psychiatric patient, the diagnosis and therapy of the psychoses, and the psychoneuroses.

The two weeks in pediatrics will be allotted for study of care of the premature infant, chemotherapy in children, rheumatic infection and its prevention, pediatric dermatology, treatment of hemangioma in infancy, technic of intravenous and bone marrow transfusions, infant feeding, diarrheas, pancreatic diseases, congenital defects, diseases of the newborn and respiratory diseases, congenital heart disease, hypertension, convulsions, intestinal parasites, management of megacolon, meningitis, communicable diseases, disturbances in growth, nutritional deficiencies and urologic conditions in childhood.

The surgical work of four weeks will emphasize surgical anatomy and the technics of special examinations, as in orthopedics and neurosurgery, for example. In addition the following subjects will be covered: anesthesia, the optic fundus, acquired and congenital anomalies, chemosurgery, the treatment of traumatic wounds, varicose veins, genitourinary infections, gallbladder and liver disease, burns, hernia, prostatic disease, diseases of the breast, appendicitis, empyema,

urologic neoplasms, peptic ulcer, gastric carcinoma and surgical pulmonary, esophageal and rectal diseases.

Two weeks will be assigned to obstetrics and gynecology, during which time the following subjects will be covered: pelvimetry, vomiting of pregnancy, abortion and premature labor, pain relief in labor, obstetric hemorrhages, normal pregnancy, minor complications of pregnancy, toxemias, normal labor, complications of the newborn, sterility, methods of gynecologic examination, leukorrhea, diseases of the cervix and of the uterus, management of the normal puerperium, puerperal infections and complications of the menopause, cesarean section, treatment of cancer of the female genital tract, diseases of the tubes and ovaries, female endocrinology, backache, radiation therapy in gynecology, and uterine malpositions. Three afternoons will be devoted to manikin demonstrations.

In addition to these review and refresher courses, the University of Wisconsin offers training for physicians in three other categories, as follows:

1. For those who wish to acquire specialty training for certification, three year residencies in all of the specialties will be available. It is planned to increase the number of residencies from a prewar number of approximately forty to about sixty.

2. A two to six months course for specialists will be available. Attendance will be open only to those who have had training in their specialty. It is designed as a review and refresher course for specialists. This course will emphasize preclinical as well as clinical aspects of each specialty and recent advances of the respective fields. The training will be both theoretical and practical and will be available in the departments of internal medicine, neuropsychiatry, surgery, obstetrics and gynecology, pediatrics, urology, orthopedics, otorhinolaryngology, ophthalmology, dermatology and physical medicine.

3. The preclinical departments are open to properly qualified men and women who wish to work for one year or more on any project in which they are interested.

SURVEY OF FACILITIES FOR TRAINING IN A SPECIALTY

Ralph K. Ghormley, M.D.

Chairman, Joint Committee of the American Orthopaedic Association and the American Academy of Orthopaedic Surgeons

The American Board of Orthopaedic Surgery has recognized for some time the need for institutions which could furnish training to discharged medical officers who have not been able to complete the requirements for examination by the board and for those who may wish to repeat any phase of training in orthopedic surgery. The secretary of the board, Dr. Guy Caldwell, pointed out this need months ago and, as chairman of the Section on Orthopedic Surgery of the American Medical Association, he has emphasized the need for more facilities for the training of orthopedic surgeons.[1]

The executive committees of the American Orthopaedic Association and the American Academy of Orthopaedic Surgeons, also realizing the importance of furnishing the necessary facilities for training such as has been mentioned, appointed a joint committee to plan for this important work. This committee has cooperated closely with the American Board of Orthopaedic Surgery. It seemed to the members of the board, as well as to the executive committees of both organizations, that the task would be best accomplished by such a joint committee rather than to leave it entirely to the board.

The joint committee studied the problem before it with two things in mind. First, adequate orthopedic training is now composed of three branches: adult orthopedic surgery, children's orthopedic surgery and the surgery of fractures and trauma. None of the surveys available seemed to show the true picture as to the number of institutions available for training in those branches. Second, the reports on Lieut. Col. Harold C. Lueth's surveys[2] were studied and the number of additional residencies probably needed was noted.

The conclusions of the joint committee were that its first task was to survey the facilities which could be used for training orthopedic surgeons. This survey must be on a nationwide scale.

It was found that partial surveys had been made in some areas by various orthopedic surgeons for local societies. Using these individuals as far as possible, and appointing other orthopedic surgeons familiar with conditions in their communities, the entire nation was divided into districts and each district was assigned to an orthopedic surgeon who the committee felt should be able to furnish the desired information. These men were asked to furnish the joint committee with the names of hospitals where orthopedic facilities were available, the number of beds available for each of the three divisions of orthopedic training, the number of residencies now available and the number of residencies contemplated in the postwar period.

In many instances the surveyors made personal visits to the centers on which they reported, thus getting first hand information and being able to offer suggestions to those concerned. The questionnaires used were made as simple as possible because the members of the joint committee felt that a large mass of needless information was often confusing, whereas the accurate recording of a minimal number of pertinent facts would constitute a much more workable survey. In some instances additional information was furnished, such as the number of hospital admissions, lists of the types of cases treated and operations done. These too were reviewed by the joint committee.

It was pointed out by the joint committee that the inclusion of an institution in the survey did not accredit that institution for training orthopedic surgeons. Accrediting must be by the Council on Medical Education and Hospitals of the American Medical Association, and approval must be by the Committee on Hospitals of the American Board of Orthopaedic Surgery.

From the reports of the various surveyors, the facts have been tabulated. The joint committee has reviewed all the results of the survey and has noted the following facts. First, because of the war, with the shortage of personnel and restriction of the number of residencies, many services are not as well staffed as in peacetime. Many of these services would welcome men from the armed services at once to augment their resident staffs. Second, a good many services are organized with adequate facilities and personnel to furnish good training for orthopedic surgeons but have not been accredited by the Council on Medical Education and Hospitals for such training. Many of these will be surveyed by the Council and accepted by the board, thus augmenting the

1. Caldwell, G. A.: Postwar Challenge to Orthopedic Surgery, J. A. M. A. **126**: 269-271 (Sept. 30) 1944.

2. Lueth, H. C.: Future Educational Objectives of Medical Officers, J. A. M. A. **125**: 1099-1103 (Aug. 19) 1944; Postgraduate Wishes of Medical Officers, ibid. **127**: 759-770 (March 31) 1945.

number of services available for training. Third, many facilities have adequate personnel and material but are not organized for training orthopedic surgeons. In most instances, officials of these institutions have expressed a desire and willingness to organize themselves for such work. The members of the joint committee feel that their main duty from now on is to help such units complete their organization in order to furnish training for orthopedic surgeons.

One of the problems the joint committee is considering is the proper placement of men in institutions to complete their training. Just which phase of orthopedic training each individual will need is not now apparent to the joint committee. It is hoped that the joint committee will be able to determine this in each instance or, at least, in a general way. If needs of individuals can be determined, a more definite plan for supplemental postwar training can be worked out in each case than otherwise would be possible.

The joint committee feels its responsibility to the men returning to civil practice from the armed services. It is fully aware, however, of the fact that much harm can be done by encouraging the use of institutions where personnel or material is inadequate. The standard of training must be kept up to a high level; otherwise the very purpose for which all are striving will be defeated. It is hoped that the efforts made will lead to a workable plan, whereby every man who leaves the service may be able to fulfil his program of training and return to civil practice with a well rounded and adequate program of instruction.

THE CONTRIBUTION OF A FOUNDATION

Robert S. Morison, M.D.
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In setting up its plan for aiding in the postservice education of returning medical officers, the Rockefeller Foundation sought to help reestablish the flow of men trained as teachers and investigators in the various branches of medicine. The normally very long training of such men ceased abruptly at the onset of war, and it seemed likely that the country would suffer a deficit in the supply of teachers, a deficit equal to a normal five to ten year output. Estimates of the further deficit in the number of "second generation" students whose training would suffer from a lack of competent young teachers cannot be accurate. The situation promised to be sufficiently grave, however, to justify a particular concern for prompt expansion in the training of such personnel as soon as decreasing military requirements allowed. It was also hoped that, if a plan could be set up in working order early in the emergency, it might demonstrate the possibilities and pitfalls likely to be encountered when large scale efforts become necessary later on.

In devising a scheme to meet these obvious needs, two principles appeared to be fundamental: flexibility and rapidity of action. The postwar needs, desires and capabilities of medical officers do not fall into a few simple categories susceptible of manipulation by rigid rules. The services in which they wish to receive further training differ in organization, numbers of patients, kinds and amounts of equipment, types of problems investigated and academic tradition. Thus, if advanced training is to be a success, the diverse characteristics of the man seeking training must be fitted to the opportunities and needs of the service in which he wishes to work. Careful individual consideration of returning medical officers is especially necessary because these men are as a rule further advanced on the nonprofessional side of their life than they are in medicine. In many instances they have acquired family responsibilities and a standard of living more appropriate to a man well established in practice or an investigative career. The peculiar demands of military life have developed their personalities and attitudes far beyond those usual in a resident hospital staff. Yet their formal medical training may have consisted only of a scanty nine months internship.

This process of adapting the opportunity to the man must be done quickly. Not only the officers but the hospitals and medical schools are impatient to set to work repairing the holes torn in medical education by the war. Another more personal consideration counseled the wisdom of promptness. It was felt that many men isolated in the outposts of a world at war might be stabilized and encouraged by early assurance that definite, well planned opportunities await their return.

In order to ensure speed and flexibility the foundation decided to leave the selection of men and the planning of individual programs entirely to the heads of the various departments to which funds have been allocated. When possible the department head has submitted a sketch of his plans to the foundation so that it may judge whether it falls within the very broad limits set up by the trustees. A record is also being kept of the names and qualifications of the men appointed. Aside from these very general requirements, the department heads have been free to expend the funds as seems best to them. The sums allocated to the various medical school departments participating in the program have varied between $4,000 and $8,000. In a few cases the entire sum will be devoted to providing a single relatively advanced man with an appointment of two or three years' duration. In others, small amounts will be given to several men as a supplement to income derived under the G. I. Bill of Rights. The duties and opportunities of the various positions will also vary from those of the familiar senior internship to the relatively advanced responsibilities of a junior member of the regular teaching and research staff. Several of the programs include study in the basic sciences related to the clinical specialties in which the assistantships are held.

One further technical point is worth mentioning: The holders of these appointments will have titles conferred by the participating institutions and appropriate to the particular individuals concerned. They are not to be known as Rockefeller fellows, and no negotiations with candidates are carried out by foundation officers. Announcement of appointments, as indeed are all other technical details, is left to the participating departments.

No effort even approaching the magnitude of the necessity could be made by a single individual or foundation. The total funds allocated by the Rockefeller Foundation now stand at $500,000. These have been divided between 65 departments in 26 schools. As this is written 34 appointments have already been made, in spite of the difficulty of arranging many of the details so far in advance of the date of expected demobilization. Unquestionably there is an enormous demand for the sort of training contemplated by the program. The foundation is therefore only too acutely aware of the inadequacy of its support, which can at best provide 250 men with a training appointment of one year.

NAVY RESIDENCIES

Rear Admiral W. J. C. Agnew (MC)
Assistant Chief, Bureau of Medicine and Surgery, United States Navy

This subject has been proposed to the Bureau of Medicine and Surgery of the United States Navy for presentation in the symposium on postwar educational rehabilitation of medical officers. It is true that the establishment of a definite program for residency-type training in the specialties in naval hospitals has had such rehabilitation as one of its objectives, but the full scope of the program includes much more than this one phase of graduate medical education.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION [1] recently afforded the Surgeon General the opportunity to outline in considerable detail the program of the Medical Corps of the Navy for internships and residency-type training. The latter was merely a logical outgrowth of the former, internships in naval hospitals having existed with formal Council approval for approximately twenty years.

The purposes in instituting a concrete plan for more advanced medical training in naval hospitals generally and uniformly throughout this country, to be based on the best of civilian standards, were outlined in the paper referred to. As stated, "This interest in the development of an educational program was . . . primarily and fundamentally because we are concerned with . . . improvement and betterment in standards of medical care of our patients. It has been entirely incidental to this that better than average opportunities for internship and residency-type training are thus provided for our medical officers."

The design of the plan was to establish by general order to medical officers in command of United States naval hospitals certain fixed, fundamental standards covering supervised study and treatment of patients, formal clinical rounds, departmental and general staff conferences, and the maintenance of excellent libraries and other educational and training facilities. Simultaneous requests were made to the Council on Medical Education and Hospitals of the American Medical Association, the American boards and the American College of Surgeons for survey and approval of these facilities for residency-type training precisely as is done by these organizations in civilian hospitals. The American College of Physicians also exercises jurisdiction, but indirectly, in such affairs.

Quite frankly, our interest in providing training in the specialties for the officers of the Medical Corps while still on duty is greater than that for the so-called rehabilitation, especially by short courses, for officers after their discharge from service, although all of these proposals undoubtedly have merit. Equally frankly, we are pleased to take advantage of the fact that there are many outstanding clinicians and teachers now serving in the reserve Medical Corps, and it is fully recognized that this has offered an unparalleled opportunity to initiate this advanced teaching program with their help, especially for the benefit of the "regulars" who must later carry it on. We are also greatly interested in the progress of our reserve officers, who cannot fail to profit from our program pending their return to civilian residencies or practice. Thus the Navy residency program may be viewed as anticipating and lessening the expected demand from naval officers for postwar training by supplying this in so many instances prior to release from active duty.

There has been some misunderstanding of our program. For example, specialty services in naval hospitals are not termed residencies, and junior medical officers assigned to such duties are not to be known as residents. The training while on duty is of the residency type and conforms to these standards, so that junior ward officers on duty in formally approved services may have time so spent accredited to them before the American boards and the American colleges. Opportunities for such assignments are limited in number, and war needs for young medical officers are still pressing.

On nearing completion of a tour of sea duty, and rotation back to the United States, a medical officer may make request to the Bureau of Medicine and Surgery, through his commanding officer, for assignment in a specialty in a naval hospital. Each such request is given close consideration by a board sitting for this purpose. If a young officer's request is justified by some substantial degree of previous special residency training or proved ability so that he can be used to the direct advantage of the patients and is thus already primed to absorb such training, he is likely to find himself so assigned as vacancies occur. Older officers, especially those fully qualified in a specialty and certified by their boards, are finding themselves appropriately assigned, more and more, for work and for teaching in their specialties. This is, obviously, to the advantage of the patients, and these officers are likewise extremely important in this educational program.

Again quite frankly, we cannot undertake during wartime to begin advanced training in a specialty for officers who have had no such training except in limited numbers of instances. Nevertheless it is important that intensive training be afforded especially to young officers of the regular Medical Corps, who will become the leaders and "key men" later in conducting the medical services of naval hospitals in the long postwar period for which provision must definitely be made. It is suggested, incidentally, that these men should profitably have only part of their residency-type training in naval hospitals, with the idea that later when we are no longer at war arrangements may be made by the Navy through affiliations for the remainder of their residency training to be obtained in civilian medical centers.

These points about residency-type training in naval hospitals have been outlined for two purposes. One of these is to show that its full scope is not limited to this one feature of rehabilitation of medical officers returning to civilian practice.

The other purpose is to reiterate and to reemphasize that it is, nevertheless, a distinct contribution to any such program. Many reserve officers are being provided with outstanding opportunities to resume their interrupted careers in training for a specialty, even while still in naval service; others, fully qualified as specialists, are finding "rehabilitation" and at the same time making important contributions to the Medical Corps, both to our younger medical officers and to our patients, while still on duty.

There seems to be one critical comment worth making on the educational plans for returning physician veterans. This is that the program has been consistently and almost exclusively directed toward veterans returning to civilian life.

1. McIntire, Ross T.: Internships and Residency-Type Training in United States Naval Hospitals, J. A. M. A. **128**: 264 (May 26) 1945.

Long after the end of this war it will be necessary to maintain a large standing army and navy with their medical officers. There is no good reason why these short "refresher" courses, or longer and more highly specialized courses, partial or complete residencies, and other educational plans for returning veterans should not also be available to and freely utilized by the officers remaining in regular service. In fact, our naval hospital residencies are not expected, in many instances, to offer a complete residency training; it is hoped and planned in the future to have our officers develop themselves further through broadening civilian contacts, and these proposed courses and residency facilities now being planned in such profusion should, properly, be open to men still in military service as well as to those returning home to practice civilian medicine.

Our point of view of the postwar medical educational problem envisions this "refresher" or rehabilitation plan developing into a permanent program of broad scope open to veterans in the reserve corps and to medical officers in the regular corps of the Army and Navy alike. We expect that our residency training program will lead to qualification of officers of the regular Medical Corps of the Navy for certification by the boards and fellowship in the colleges and will likewise qualify them for membership and fellowship in the various national special societies. The Medical Corps of the Navy recognizes fully the advantages that have come from the drawing in of reserve officers from civilian life, and it does not wish to lose these contacts.

In other words, everything possible should be sought to develop all officers of the Medical Corps of the Navy and to effect a closer liaison in peacetime between military and civilian medical practice and practitioners than may have existed heretofore.

It is my belief also that our ambition to provide such opportunities for advanced medical training both in and out of the specialties with development of personal attainments and national recognition offers a great inducement for medical officers, now serving for patriotic reasons, to make a permanent career of naval service.

ARMY REFRESHER COURSES

Lieutenant Colonel Harold C. Lueth, M. C., A. U. S.
Office of the Surgeon General

The Army has taken definite steps for assisting medical officers in getting refresher work in hospital training while they are still in the military service. Early this year steps were taken so that officers assigned to field, tactical and administrative positions would be given an opportunity to get a twelve week refresher course in one of the large named general hospitals in this country. Before the defeat of Germany all medical officers who returned from overseas assignments had the chance to apply for such training. At present many officers returning from overseas are applying for refresher training. A postcard application Form WD AGO 8-94 filled out at reception stations made it possible for returnees except those in redeployed units to apply almost as soon as they arrived in the United States.

Assignment to refresher courses has been limited to officers who volunteered for this work and who were previously assigned to command, administrative or semiprofessional positions for one year or more. Applications are received and processed by the Personnel Service, Office of the Surgeon General. Preference was given to officers who returned from overseas, though those serving in the continental United States were not excluded. It is the present policy to assign not more than six officers to any one service, and no hospital will have more than twelve students at any one time. During the last four months more than 170 officers have been assigned to refresher courses.

Refresher training courses were in several main fields, as medicine, surgery and laboratory work. Courses in medicine and surgery followed broad schedules that had been developed in the Training Division of the Office of the Surgeon General. For example, at Tilton General Hospital special schedules have been evolved to fit the needs of the students and the available teaching material. They included two hours of actual contact and work with the patient. Ward work at which a complete history is obtained and a careful physical examination is made constitutes a specimen of the type of instruction in internal medicine. Courses in surgery include careful attention to operating room procedures and to preoperative and postoperative care. Administration of fluids and the treatment of shock, control of pain, treatment of fractures and use of penicillin, sulfonamides and other means of modern therapy are some of the main subjects taught. In medicine emphasis is placed on new diagnostic procedures, treatment of tropical diseases and other recent advances in treatment. Student officers in medicine are rotated between the section of general medicine, cardiology, gastroenterology, neuropsychiatry, allergy, communicable diseases and dermatology. Surgical refresher courses included the allied specialties of orthopedic, genitourinary and septic surgery and when available anesthesia, eye, ear, nose and throat, neurologic and thoracic surgery. An hour clinical conference is usually held in the morning before lunch, during which some special subject is discussed in detail by a chief of service, section or branch. In the afternoon an opportunity is given men to follow the chiefs of services in their ward rounds. An applicatory or on the job method of training is afforded to all students. Some hospitals have special x-ray conferences, clinical pathology and the other staff meetings. All schedules have a clinical pathologic conference at least once a week. Attendance at boards to determine the disposition of patients either for retirement, discharge for medical reasons or return to duty is optional and not a required part of the training. The abundance of clinical material in the large general hospitals, the presence of a qualified professional staff, who serve as instructors, and the availability of medical libraries make such courses very desirable educational methods of instruction.

Similar courses in laboratory work are offered to laboratory officers who have been assigned for the past year or more to administrative or command duties. The resources of Service Command laboratories are utilized and men are given an opportunity to study all phases of laboratory procedure, including bacteriology, parasitology, biochemistry and clinical pathology.

Considerable time and thought have been given the matter of refresher training to medical officers in Europe. Basic medical and surgical refresher training is being given in a number of cities in Europe. Medical officers awaiting transportation to the United States may apply for these courses. It has been reported that more than eight hundred officers are currently enrolled in the basic courses of medicine and surgery. Advanced courses of instruction are open to fewer but more highly trained medical officers. There are courses in anesthesiology, radiology, physical therapy, cardiology and

ophthalmology. Applicants must have completed at least one year or more of training after completing their internship in the special field in which further instruction is desired. Medical officers assigned to general hospitals as ward officers in these fields, on request, may be given intensive training for two months. Training of this type probably will be acceptable to the American specialty boards as a partial fulfilment of some of their requirements. With these restrictions it is evident that two month courses are not designed to produce qualified specialists, but they should be recognized as a supplementary method of training.

In a number of island bases there have been established basic medical courses designed to help the general practitioner. They include instruction in new methods of diagnosis, treatment, laboratory procedures and some work in anesthesiology, radiology and physical medicine. In the Army many of the special features of medical practice are referred to specialists, whereas in civilian general practice the doctor himself frequently is required to assume some of this work himself. This is especially true for laboratory work, anesthesiology and eye, ear, nose and throat work. General practitioners will benefit most from these courses.

Medical and surgical consultants of the European Theater have been most helpful in selecting qualified teachers to give both the basic and the advanced courses of instruction. Courses are well attended, give excellent training and are enthusiastically accepted by the student officers. In Paris, Edinburgh, Glasgow, London and Oxford, existing medical schools and civilian faculties have been utilized to help give these courses.

At the named general hospitals in the United States the chiefs of medicine and surgery are largely responsible for the instructional work. In some service commands the consultants are called on to give an occasional lecture or clinical demonstration. The facilities of the Wartime Graduate Medical Meetings are also useful in supplementary instructional work at the general hospitals. Excellent clinical pathologic conferences have been arranged at several general hospitals. Medical officers have been very enthusiastic about this type of refresher training and have expressed great satisfaction in being allowed to get such work. Through these means it is believed that the Army is doing much toward assisting medical officers in regaining whatever professional skills they might have lost as a result of pure military assignments.

FORTY-FIFTH ANNUAL REPORT ON MEDICAL EDUCATION IN THE UNITED STATES AND CANADA

Victor Johnson, Ph.D., M.D.
Secretary, Council on Medical Education and Hospitals of the American Medical Association

In this forty-fifth annual compilation of information and statistics on medical education in the United States and Canada are included discussions of the military programs in medical schools, the supply of incoming medical students and the changing status of the accelerated program.

In addition there are included the calendars of the medical schools and data on enrolments, graduates, premedical education, licensure, internships, fees, continuation courses and specialty boards. Medical schools are described and recent educational developments discussed.

The Educational Number of THE JOURNAL provides essential material of great value to military and government agencies, medical schools, physicians, medical educators, hospital officials, students, interns, residents and those concerned with specialty certification and graduate and postgraduate medical education.

In the wartime days of multiple demands on every one's time and energy, it has been particularly gratifying to the Council and to THE JOURNAL to receive the wholehearted cooperation of all concerned with supplying the information compiled in this Educational Number. Military and government officials and officers of medical schools and other institutions have faithfully provided the Council not only with the material in this issue but with many other records throughout the year. They have generously assisted the Council staff in its inspections and surveys. For these services, sincere thanks are due not only from the Council and THE JOURNAL but also from every one who finds this publication useful.

THE SUPPLY OF MEDICAL STUDENTS

With the cessation of hostilities and the probable discontinuation of induction into the armed forces in the near future, every effort must be directed toward a resumption of the training of qualified premedical students in adequate numbers. During the past year there have been virtually no able bodied male students in this field. Even after demobilization is complete, we shall probably need about 30,000 more physicians than before the war, primarily because of the requirements of the Veterans Administration (about 15,000) but also because of the needs of the peacetime Navy (about 5,000) and the Army plus possibly a compulsory universal military training program (about 10,000). This estimate disregards extra physicians required to provide replacements for casualties among medical officers, medical assistance to liberated countries and the more complete and extensive medical care demanded in this country.

Even if admissions, enrolments and graduations from our medical schools should continue at the present levels, only about half of this need would be met, since 40,000 students enrolling would receive the M.D. degree in the period 1942 to 1948 and 24,000 physicians will have died during that time. Thus, under the most favorable conditions only about 16,000 additional physicians will be available after the war to do the work of 30,000.

From now until at least 1947, medical school freshmen must be women, or men who were physically disqualified, under or over the draft age or veterans. Because people in these categories are limited in numbers, those admitted to our medical schools in the next year or two will be appreciably reduced in numbers or in quality.

The termination of the war earlier than every one anticipated was more than fortunate for numerous reasons; yet considerable damage has already resulted in medical education. There will probably be a lag for the better part of a year before the numbers and quality of men in premedical studies will reach the prewar levels.

MEDICAL SCHOOL CALENDARS

Before the war practically all medical schools admitted a freshman class each fall and graduated a class each spring, with one academic session per calendar year. Educational data could be presented annually without confusion arising as to which class was being discussed. This regularity is no longer the case. Schools commenced the accelerated program at different times, and

Therefore it is necessary to identify which session is being described in this Educational Number and relate it to sessions described in preceding Educational Numbers. In the 1943 Educational Number most of the data presented applied to the "session preceding the first class entering in 1943." Most of the information presented in 1944 applied to the succeeding session, "the first session commencing in 1943."

TABLE 1.—*Admission and Graduation Calendars of Medical Schools in the United States*

SCHOOL	Sessions for Which Data Are Given in This Educational Number: Freshman Session Began	Date of First Graduation	Date of Second Graduation	Dates of Next Two Entering Classes		Dates of Next Two Graduating Classes	
University of **Arkansas** School of Medicine	1- 2-45	12-18-44	.....	10- 1-45	10- 1-46	9-24-45	6-24-46
University of **California** Medical School	3- 1-45	10-22-44	6-23-45	10-29-45	†	2-23-46	10-19-46
College of Medical Evangelists	12-31-44	6- 1-44	3-45	10- 5-45	9-30-46	10- 1-45	6-46
University of Southern California School of Medicine	10-30-44	3- 1-44	2- 1-45	8- 6-45	†	1- 1-46	1-47
Stanford University School of Medicine	1- 8-45	10-13-44	6-17-45	10- 8-45	10- 7-46	4- 5-46	4-47
University of **Colorado** School of Medicine	10- 2-44	9-19-44	6-26-45	7- 2-45	†	3-19-46	†
Yale University **(Connecticut)**	9-25-44	9-16-44	6-16-45	9-24-45	9-26-46	3-20-46	12-18-46
Georgetown University **(District of Columbia)**	10- 9-44	9-17-44	6-23-45	9-10-45	9-16-46	3-31-46	1-15-47
George Washington University	9-18-44	9-19-44	6-45	9-17-45	9-16-46	2-22-46	11-11-46
Howard University College of Medicine	12-28-44	12-22-44	.....	9-29-45	9-30-46	9- 7-45	6- 7-46
Emory University School of Medicine **(Georgia)**	10- 2-44	9-16-44	6-16-45	9-24-45	9-23-46	3-19-46	12-18-46
University of Georgia School of Medicine	9-27-44	9-11-44	6-11-45	9-27-45	9-25-46	3-25-46	3-23-47
Loyola University **(Illinois)**	10- 2-44	9-23-44	6-23-45	10- 1-45	10- 1-46	4-20-46	2- 1-47
Northwestern University Medical School	9-27-44	9-30-44‡	6-13-45*	10- 1-45	10- 1-46	3-21-46	12-47
University of Chicago, The School of Medicine	9-25-44	9- 8-44‡‡	6-15-45*	6-19-45	6-20-46	3-46	12-47
University of Illinois College of Medicine	1- 2-45	12-15-44	.....	10- 1-45	10- 1-46	9-14-45	6-21-46
Indiana University School of Medicine	12-28-44	4-23-44	12-21-44	9- 3-45	9-46	4-46	†
State University of **Iowa** College of Medicine	10- 2-44	9-24-44	6-16-45	9-24-45	9-24-46	3-24-46	12-21-46
University of **Kansas** School of Medicine	10-30-44	10-29-44	6-24-45	9-17-45	9-16-46	3- 1-46	12-15-46
University of Louisville **(Kentucky)**	9-27-44	9- 8-44	6-15-45	7-11-45	4-17-46	3-22-46	12-14-46
Louisiana State University School of Medicine	9-27-44	9- 6-44	6-13-45	9-13-45	9-46	3-13-46	12-46
Tulane University School of Medicine	12- 1-44	10-14-44	.....	9- 1-45	9- 1-46	5-15-46	2-15-47
Johns Hopkins University **(Maryland)**	9-25-44	8-18-44	6- 7-45	9-10-45	9-16-46	3-19-46	12-23-46
University of Maryland School of Medicine	10-17-44	9-29-44	6-22-45	9-19-45	9-18-46	3-22-46	12-26-46
Boston University **(Massachusetts)**	10- 5-44	9-22-44	6-22-45	9-21-45	9-46	3-22-46	12-20-46
Harvard Medical School	10- 2-44	9-25-44	6-23-45	9-24-45	9-23-46	3-23-46	12-20-46
Tufts College Medical School	10- 2-44	9-24-44	6- 2-45	9-17-45	9-46	3-46	12-46
University of **Michigan** Medical School	10-30-44	7-29-44	.....	10-29-45	10-28-46	9-15-45	10-12-46
Wayne University College of Medicine	10- 2-44	9-28-44	6-23-45	7- 2-45	4- 1-46	3-23-46	12-46
University of **Minnesota** Medical School	10- 2-44	8-24-44	6-15-45	7- 2-45	4- 1-46	3-21-46	12-46
St. Louis University **(Missouri)**	8-28-44	9-21-44	6-14-45	6-29-45	9-46	2-28-46	†
Washington University School of Medicine	10- 5-44	9-12-44	6-23-45	9-27-45	9-26-46	3-23-46	12-21-46
Creighton University **(Nebraska)**	9-28-44	9-22-44	6- 2-45	9-28-45	9-28-46	3-16-46	12-20-46
University of Nebraska College of Medicine	10- 2-44	9-23-44	6-16-45	9-20-45	9-46	3-23-46	12-21-46
Albany Medical College **(New York)**	10- 2-44	9-23-44	6-16-45	7- 2-45	9-30-46	3-23-46	12-21-46
Long Island College of Medicine	10- 2-44	9-28-44	6-28-45	9-24-45	9-23-46	3-23-46	12-21-46
University of Buffalo School of Medicine	1- 2-45	9-26-44	6-23-45	10- 1-45	9-30-46	6-22-46	3-22-47
Columbia University College of Physicians and Surgeons	10- 5-44	9-28-44	6-28-45	10- 4-45	9-12-46	3-23-46	12-46
Cornell University Medical College	9-28-44	9-26-44	6-26-45	10- 1-45	10- 1-46	4- 2-46	12-46
New York Medical College	10- 2-44	9 28-44	6-13-45	9-17-45	9-15-46	6-46	†
New York University College of Medicine	10- 9-44	9-28-44	6-16-45	10- 1-45	10- 1-46	3-28-46	12-30-46
University of Rochester School of Medicine	10- 2-44	9-23-44	6-16-45	10- 1-45	9-30-46	3-23-46	12-14-46
Syracuse University College of Medicine	1- 2-45	9-24-44	6-24-45	10- 1-45	10- 1-46	6-23-46	3-47
Duke University School of Medicine **(N. Carolina)**	10- 2-44	9-23-44	6- 8-45	10- 1-45	9-30-46	3-23-46	12-31-46
Bowman Gray School of Medicine	9-27-44	9-25-44	6-17-45	9-26-45	9-25-46	3-23-46	3-26-47
University of Cincinnati **(Ohio)**	9- 5-44	8-25-44	6- 8-45	10- 8-45	11-25-46	2-22-46	11- 9-46
Western Reserve University School of Medicine	8-28-44	9-25-44	6-22-45	9-17-45	9-26-46	3-15-46	1- 4-47
Ohio State University College of Medicine	10- 3-44	9- 1-44	6- 8-45	10- 2-45	9-46	3-15-46	†
University of **Oklahoma** School of Medicine	9-15-44	9-15-44	6-15-44	7- 2-45	8-19-46	3-22-46	12-20-46
University of **Oregon** Medical School	10- 2-44	9-21-44	6-22-45	7- 2-45	7- 1-46	3-22-46	12-20-46
Hahnemann Medical College **(Pennsylvania)**	10- 2-44	9-14-44	6-14-45	10- 1-45	†	3-14-46	†
Jefferson Medical College of Philadelphia	10- 9-44	9-22-44	6-22-45	10- 1-45	†	5- 5-46	†
Temple University School of Medicine	10- 2-44	9-14-44	6-21-45	7- 2-45	9-18-46	3-21-46	12-19-46
University of Pennsylvania School of Medicine	10- 2-44	9-23-44	6-18-45	9-24-45	9-23-46	4-46	12-46
Woman's Medical College of Pennsylvania	9- 1-44	.....	1-10-45	9-10-45	9- 1-46	1-10-46	6- 1-47
University of Pittsburgh School of Medicine	10- 2-44	9-29-44	6-16-45	10- 1-45	9-30-46	4-46	12-21-46
Medical College of the State of **South Carolina**	10- 2-44	9-16-44	6-16-45	9-27-45	9-26-46	3- 9-46	†
University of **Tennessee** College of Medicine	1- 1-45	9-18-44‡	6-45‡	9-45	12-45x	9-24-45	12-45x
Meharry Medical College	12-27-44	12-17-44	.....	9-27-45	7-46	9-16-45	7- 1-46
Vanderbilt University School of Medicine	9-18-44	9-11-44	6-11-45	6-18-45	9-16-46	3-15-46	12- 7-46
Southwestern Medical College **(Texas)**	1- 8-45	12-18-44	.....	10- 1-45	10- 1-46	9- 3-45	6-24-46
Baylor University College of Medicine	11-20-44	11-13-44	.....	9- 3-45	9- 3-46	3-25-46	†
University of Texas School of Medicine	6-28-44	6-24-44	6- 2-45	9-13-45	11- 1-46	3- 9-46	†
University of **Utah** School of Medicine	9-13-44	9- 6-44	6- 5-45	9-12-45	†	3-46	†
University of **Vermont** College of Medicine	9-25-44	9-13-44	6-20-45	7- 5-45	4-15-46	4- 3-46	12-23-46
University of **Virginia** Department of Medicine	9-29-44	9-14-44	6-23-45	7- 6-45	4- 1-46	3-20-46	12-15-46
Medical College of Virginia	10- 4-44	9-23-44	6-16-45	10- 1-45	9-26-46	3-23-46	12-21-46
University of **Wisconsin** Medical School	1- 1-45	9-23-44	6-26-45	9-24-45	9-24-46	5-25-46	3- 1-47
Marquette University School of Medicine	5- 7-45	9-27-44	.....	6-24-46	9-47	3- 1-46	11- 4-46

† Not yet determined. ‡ Also June 1944. * Also December 1944 and March 1945. ‡‡ Also March and June 1944.
‡ Also June and December 1944. $ Also March 1945. x Also March and June 1946.

other local conditions varied so that admission and graduation dates are distributed throughout the year, as shown in tables 1, 2 and 3. Even within a given school the various classes (freshman to senior) may have different dates for the beginning and ending of the academic year; this will become increasingly true as more schools return to annual admissions while still accelerating.

Most of the material presented in the current issue applies to that session which for most schools began in September or October of 1944 and terminated in June 1945. This session will henceforth be referred to as the 1944-1945 session, even though this academic year commenced early in 1945 in a few schools. Since the publication of the 1944 Educational Number and up to June 30, 1945 all medical schools have had two gradu-

ating classes, except ten schools (Arkansas, Howard, Illinois, Tulane, Michigan, Woman's Medical, Meharry, Southwestern, Baylor and Marquette) in the United States and all but four (Manitoba, McGill, Montreal and Laval) in Canada. The opening and graduation dates which identify the sessions for which data are presented in the current issue are given for each school in tables 1, 2 and 3.

These tables also present the dates of the next two entering freshman classes as well as the next two graduation dates, except in a few instances in which schools give the date for one graduating class. The admission dates given indicate that a return to annual admissions henceforth is now planned in all medical and basic science schools in the United States except for six schools (Louisville, Wayne, Minnesota, Meharry, Vermont and Virginia) still planning to continue the graduate students next in March 1946, although there will be graduates every month except November 1945 in this twelve month period. This table will be particularly valuable to internship hospitals by giving the numbers of graduates from the various schools and the times they will become available for internships. These figures are recapitulated in table 5, which also shows the number of schools admitting new freshman classes during each month of the ensuing twelve months.

By June 30, 1945 all medical schools in the United States except ten and all but four in Canada had completed a cycle of four graduating classes in three calendar years. During these three years, to June 30, 1945 there have been 20,662 graduates in the United States. By comparison there were 15,535 graduates in the three immediately preceding prewar years to June 30, 1942. This represents the graduation of an extra 5,127 stu-

TABLE 2.—*Admission and Graduation Calendars of Medical Schools in Canada*

SCHOOL	Session for Which Data Are Given in This Educational Number: Freshman Session Began	Date of First Graduation	Date of Second Graduation	Dates of Next Two Entering Classes		Dates of Next Two Graduating Classes	
University of Alberta (Canada)	9-28-44	5-17-44	1- 6-45	9-17-45	9-16-46	1-46	9-31-46
University of Manitoba Faculty of Medicine	9-26-44	.....	2-14-45	9-45	9-14-46	10-31-45	5-46
Dalhousie University Faculty of Medicine	9-12-44	5-16-44	5-15-45	9-12-45	9-11-46	5-13-47	†
Queen's University Faculty of Medicine	9-25-44	5- 4-44	2-15-45	10- 1-45	9-23-46	2-15-46	5-19-47
University of Western Ontario Medical School	9-25-44	5-15-44	6-15-45	9-24-45	9-23-46	3-20-46	6- 7-47
University of Toronto Faculty of Medicine	9-26-44	5- 5-44	2-16-45	9-25-45	9-24-46	2-15-46	†
McGill University Faculty of Medicine	9- 6-44	7-31-44	.....	9- 5-45	9- 4-46	10- 6-45	5-15-47
University of Montreal Faculty of Medicine	9-18-44	7-31-44	.....	9-15-45	9-15-46	9-45	3-47
Laval University Faculty of Medicine	9-14-44	6-30-44	.....	9-14-45	9-10-46	6-20-46	7- 1-47
University of Saskatchewan School of Medical Sciences	10-10-44	.....	.....	10- 1-45	10-46	.....	.....

† Not yet determined.

TABLE 3.—*Admission Calendars of Schools of the Basic Medical Sciences in the United States*

SCHOOL	Session for Which Data Are Given in This Educational Number: Freshman Session Began	Dates of Next Two Entering Classes for Freshmen	
University of Alabama School of Medicine	9- 4-44	10- 8-45	10- 7-46
University of Mississippi School of Medicine	1-29-45	9-25-45	9-24-46
University of Missouri School of Medicine	9-16-44	9-22-45	9-22-46
Dartmouth Medical School (New Hampshire)	3- 5-45	11- 5-45*	†
University of North Carolina School of Medicine	9-18-44	9-17-45	9-16-46
University of North Dakota School of Medicine	1- 2-45	9-24-45	9-23-46
University of South Dakota School of Medicine	9-11-44	9-17-45	9-16-46
West Virginia University School of Medicine	9-25-44	9-24-45	9-23-46

* Tentative. † Not yet determined.

more frequent admissions and seven schools (California, Southern California, Hahnemann, Jefferson, Colorado, Utah and Dartmouth) which have not yet determined their calendars. It is probable that some of these institutions will decide to return to annual admissions before the 1946 class enters. Tennessee will continue to admit students quarterly.

All Canadian schools have returned to annual admissions.

THE ACCELERATED PROGRAM

Even though admissions are annual, acceleration will be continued for upper classes containing military student personnel, at least for the present. Therefore graduations will occur every nine months as long as acceleration continues in upper classes which entered school at nine month intervals. All Canadian schools have commenced to decelerate, and in some of them this adjustment has been completed for all classes.

The distribution of graduates throughout the next year is given by schools in table 4. Most schools will

dents in the past three years. This contribution of medical schools to the successful prosecution of the war is immeasurable, coming at a time when faculties were depleted in numbers and the demands on the time and energy of those remaining were excessive. Five thousand extra physicians can provide medical care for 100,000 hospitalized veterans, 1,000,000 soldiers or sailors or 4,000,000 civilians. However, the recent policies of the national authorities pertaining to premedical students will more than offset this net gain in the next few years.

During the past three years there has been a fairly general agreement that the accelerated program conducted during that time has been educationally undesirable. However, it is important to remember that factors other than acceleration itself have operated to the detriment of the medical educational program. Important among these have been the necessity for continuous teaching by most instructors, and the shortage of instructors.

These two difficulties will now be partially corrected. With annual admissions, even though acceleration is continued, the teaching load of the staff is reduced. If a school is on the quarter system accelerating and admitting a new class every October there will be no freshmen in school during the summer quarter, no sophomores in the spring, no juniors in the winter and no seniors in the autumn. It follows that a faculty member who teaches only freshmen will have no teaching duties in the summer. One who teaches only sophomores will be free from teaching in the spring, and so on. In addition, the prospects seem good for the return from military duty of a significant number of key teachers in the next few months.

It would be highly desirable to continue the experiment of medical school acceleration under these somewhat more favorable conditions. In attempting to assess the educational desirability of some acceleration it is necessary to evaluate independently the various factors which have operated in our medical school programs. An uncritical urge to return to the "good old days" of the traditional calendar should be avoided. Certainly medical schools should oppose the peacetime compulsions by law or licensure regulations preventing even the most competent students from completing their work in three years, by requiring a specified time to elapse before completion of the medical work.

TABLE 4.—*Estimated Number of Graduates of Medical Colleges, July 1, 1945 to June 30, 1946*

	1945						1946					
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
University of **Arkansas**	..	...	65	..	..	..	..	...	...	...	...	61
College of Medical Evangelists (**California**)	..	...	...	85	..	..	4	...	...	4	...	...
Stanford University	..	...	...	..	..	..	..	...	...	61	...	...
University of California	..	...	...	..	..	..	..	74	...	...	...	...
University of Southern California	..	...	...	..	..	..	63	...	...	...	...	...
University of **Colorado**	..	...	...	..	..	..	..	...	55	...	...	...
Yale University (**Connecticut**)	..	...	...	..	..	..	..	...	60	...	...	...
George Washington University (**District of Columbia**)	..	...	...	..	..	..	..	83	...	...	...	...
Georgetown University	..	...	...	..	..	..	..	...	85	...	...	...
Howard University	..	...	58	..	..	..	..	...	...	...	...	68
Emory University (**Georgia**)	..	...	...	..	..	..	..	...	65	...	...	...
University of Georgia	..	...	...	..	..	..	..	...	69	...	...	...
Loyola University (**Illinois**)	..	...	...	..	..	..	..	...	...	70	...	...
Northwestern University	..	...	17	..	..	4	..	...	137	...	...	...
University of Chicago School of Medicine	..	...	3	..	..	1	..	...	53	...	...	1
University of Illinois	..	...	180	..	..	3	..	...	...	...	...	175
Indiana University	..	101	...	..	..	..	..	...	...	82	...	...
State University of **Iowa**	..	...	1	..	..	..	..	...	66	...	...	...
University of **Kansas**	..	...	...	..	..	..	..	...	75	...	...	...
University of Louisville (**Kentucky**)	..	...	...	..	..	..	..	...	91	...	...	...
Louisiana State University	..	...	...	..	..	..	..	...	71	...	...	...
Tulane University	..	136	...	..	..	..	..	...	...	...	128	...
Johns Hopkins University (**Maryland**)	..	...	...	..	..	..	..	...	76	...	...	...
University of Maryland	..	...	...	..	..	..	..	...	98	...	...	...
Boston University (**Massachusetts**)	..	...	...	..	..	..	..	...	63	...	...	...
Harvard Medical School	..	...	...	..	..	..	..	...	140	...	...	2
Tufts College Medical School	..	...	...	..	..	..	..	...	104	...	...	...
University of **Michigan**	..	...	138	..	..	..	..	...	...	...	...	...
Wayne University	..	...	...	..	..	..	..	...	56	...	...	...
University of **Minnesota**	..	...	...	..	..	2	..	...	120	...	...	...
St. Louis University (**Missouri**)	..	...	...	..	..	..	..	124	...	...	...	...
Washington University	..	...	...	..	..	..	..	...	94	...	...	...
Creighton University (**Nebraska**)	..	...	...	..	..	..	..	...	59	...	...	...
University of Nebraska	..	...	...	..	..	..	..	...	75	...	...	...
Albany Medical College (**New York**)	..	...	...	..	..	..	..	...	46	...	...	...
Columbia University	..	...	...	..	..	..	..	...	114	...	...	...
Cornell University	..	...	...	..	..	..	..	...	...	80	...	...
Long Island College of Medicine	..	...	...	..	..	..	..	...	103	...	...	...
New York Medical College	..	...	...	..	..	..	..	...	...	...	...	96
New York University	..	...	...	..	..	..	..	...	133	...	...	...
Syracuse University	..	...	...	..	..	..	..	...	...	...	...	47
University of Buffalo	..	...	...	..	..	..	..	...	...	...	...	80
University of Rochester	..	...	...	..	..	..	..	...	66	...	...	...
Duke University (**North Carolina**)	..	...	1	..	..	..	..	...	72	...	...	...
Bowman Gray School of Medicine	..	...	7	..	..	..	..	...	41	...	...	2
Ohio State University	..	...	...	..	..	..	..	...	73	...	...	...
University of Cincinnati	..	...	...	..	..	..	..	78	...	...	...	...
Western Reserve University	..	...	...	..	..	..	..	...	82	...	...	...
University of **Oklahoma**	..	...	...	..	..	..	..	...	70	...	...	...
University of **Oregon**	..	...	...	..	..	..	..	...	68	...	...	...
Hahnemann Medical College (**Pennsylvania**)	..	...	...	..	..	..	..	...	120	...	...	...
Jefferson Medical College	..	...	...	..	..	..	..	...	...	...	155	...
Temple University	..	...	...	..	..	..	..	...	118	...	...	...
University of Pennsylvania	..	...	...	..	..	..	..	...	...	135	...	...
University of Pittsburgh	..	...	...	..	..	..	..	...	...	78	...	...
Woman's Medical College	..	...	...	..	..	..	37	...	...	...	...	...
Medical College of **South Carolina**	..	...	...	..	..	..	..	...	43	...	...	...
Meharry Medical College (**Tennessee**)	..	...	64	..	..	..	..	...	...	...	...	...
University of Tennessee	..	...	41	..	..	26	..	...	33	...	...	38
Vanderbilt University	..	...	...	..	..	..	..	...	48	...	...	...
Baylor University, **Texas**	39	...	...	..	..	..	..	...	51	...	...	...
Southwestern Medical College	..	...	48	..	..	..	..	...	...	...	...	37
University of **Texas**	..	...	...	..	..	..	..	...	90	...	...	...
University of **Utah**	..	...	...	..	..	..	..	...	38	...	...	...
University of **Vermont**	..	...	...	..	..	..	..	...	...	37	...	...
Medical College of **Virginia**	..	...	...	..	..	..	..	...	90	...	...	...
University of Virginia	..	...	...	..	..	..	..	...	66	...	...	...
Marquette University (**Wisconsin**)	80	...	...	..	..	..	..	...	86	...	...	...
University of Wisconsin	..	...	...	..	..	..	..	...	...	...	74	...
Totals	119	237	623	85	0	36	104	359	3,363	547	357	607

It seems probable that some schools will continue the accelerated program in modified form with annual vacation periods somewhat intermediate between the too long peacetime three to four months and the too short wartime intermissions.

It appears that all the licensure difficulties introduced by the accelerated program have been appropriately adjusted, at least so far as the work in the medical school itself is concerned, for the duration of the emergency. Unfortunately, some of the states have indicated an immediate return to prewar regulations when the

emergency is over. In some instances this will mean that even the most highly qualified students will be prevented by law from completing their medical studies in less than a stipulated minimum number of months. Whether or not some degree of acceleration is educationally desirable, no state law should require every student to take an annual vacation of sharply defined duration.

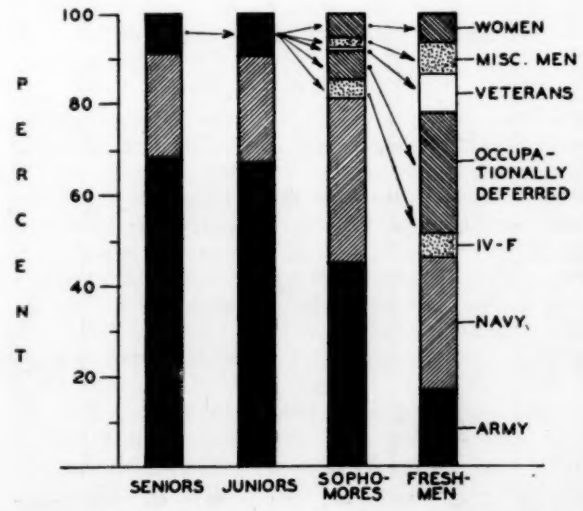
TABLE 5.—*Distribution of Admission Dates by Schools and Estimated Number of Graduates for the Months July 1945 Through June 1946 in the United States; Schools of the Basic Medical Sciences Are Not Included*

1945	Number of New Freshman Classes Entering	Number of Graduates (Estimated)
July	10	119
August	1	237
September	32	623
October	22	85
November	..	....
December	..	36
1946		
January	..	104
February	..	359
March	..	3,363
April	5	547
May	..	357
June	1	607
Total		6,437

The relationship of licensure to the "acceleration" of the 9-9-9 internship and residency program is further discussed on page 52.

THE MILITARY AND CIVILIAN STATUS OF MEDICAL STUDENTS

The military status of medical students in the United States is shown, by schools, in table 6. Nearly 80 per cent of all medical students are in the Army or Navy programs. The distribution of students in military and civilian categories by classes is shown in table 7 and in the chart. There has been a decided change in the composition of medical classes in the years since the military programs commenced in our medical schools. In the senior and junior 1944-1945 classes over 90 per cent of the students are in Army or Navy programs. In the sophomore class this percentage just exceeds 80. The freshman class shows a sharp decrease in military students. Over half of them are in a civilian status. In this class there are 5.3 per cent of physically disqualified males, 7.2 per cent of women, 8.6 per cent of veterans and 26.2 per cent of occupationally deferred men. This large number of deferred men resulted from a special but temporary concession of the Selective Service System. Army students now in A. S. T. premedical work will be available for one class in 1945 in each medical school, and Navy V-12 men will also be assigned to 1945 entering classes. However, the medical schools estimate a reduction in the 1945-1946 entering freshman class. In 1946 medical schools must obtain their students from sources which supplied only about one fourth of the 1944-1945 freshmen. One of two consequences is inevitable: There will be too few applicants to provide a full freshman class or some schools will admit inferior applicants.



Percentage distribution of students in military and civilian categories by classes, 1944-1945.

There already is evidence of the latter. Certain schools have already admitted some men with very questionable qualifications for the study and practice of medicine. Despite a postwar need for more physicians than were required before the war, the admission of incompetent men or women to our schools cannot be tolerated, since these people will be the doctors of tomorrow. The Council on Medical Education and Hospitals of the American Medical Association will be especially concerned with the quality of freshmen admitted to our schools in the next few years.

PREMEDICAL EDUCATION

The premedical curriculums of the Army Specialized Training and the Navy V-12 programs are acceptable to all schools holding contracts for Army and Navy medical students. These programs also meet the minimum admission requirements formulated by the Council on Medical Education and Hospitals of the American Medical Association and by those states whose licensure laws include specific premedical requirements.

For civilian applicants, most schools state their 1946 admission requirements in academic years or semester hours. In tables 8 and 9 (pages 46, 47 and 48) these are given for each medical and basic science school in the United States and Canada. The trend toward the former prewar requirements continues. Compared with thirty-nine schools in 1945, there are fifty-six schools requiring more than two years of college preparation for students entering in 1946. There are three schools (two Canadian) requiring a degree or four years of college, fifty-three schools requiring about three years, and thirty asking about two years. One Canadian school admits students after one year of premedical work.

The American Council on Education has received a grant of $150,000 from the Carnegie Corporation of New York and the General Education Board for the study of various wartime accelerated and other special educational programs to determine whether certain features of such plans appear to warrant permanent inclusion in our educational armamentarium. It is hoped that the premedical A. S. T. and Navy V-12 programs will be included in this study. It would be particularly important to know the relative performance in the first year of medical school by these military students as compared with those who took their premedical work in nonaccelerated programs either during or prior to the war. There seems to be a general impression among medical school faculties that students entering now are inferior to those entering before the war, but there are few objective data and the results of premedical acceleration are not clearly differentiated from

those of the medical years or from other undesirable features of the wartime medical school program. If the data could be obtained, it would also be important to know whether significant numbers of qualified men have recently been enabled to study premedicine and medicine because of the government subsidization of past, it would seem to be axiomatic that the ability of a man or woman to pay for a medical education should not be a determining factor in the selection of the student for such study.

An issue of some moment has been raised by the plans of the American Council on Education and other

TABLE 6.—*Military and Civilian Status of Medical Students in the United States by Schools, 1944-1945*

	A.S.T.P.	V-12	Army Reserves (Inactive)	Navy Reserves (Inactive)	Veterans	IV-F	Occupationally Deferred	Under 18	Other Men	Women	Total
University of **Alabama**	30	44	1	..	1	4	27	..	..	7	114
University of **Arkansas**	121	80	..	..	4	12	33	..	6	10	266
University of **California**	102	93	..	..	..	..	..	1	72	28	296
College of Medical Evangelists	191	19	7	..	6	16	99	..	15	18	371
University of Southern California	126	75	..	1	4	5	34	..	..	9	254
Stanford University	78	93	7	5	3	7	24	..	5	18	240
University of **Colorado**	115	53	1	..	7	16	32	..	..	13	237
Yale University (**Connecticut**)	112	87	6	..	8	3	14	..	1	19	250
Georgetown University (**District of Columbia**)	155	126	..	1	16	2	66	..	1	..	367
George Washington University	132	100	6	1	10	2	45	1	1	18	316
Howard University	157	..	14	..	9	5	71	..	2	15	273
Emory University (**Georgia**)	108	93	6	..	..	3	30	..	2	6	248
University of Georgia	143	68	..	..	3	10	49	..	..	12	285
Loyola University (**Illinois**)	139	80	10	..	10	12	33	..	10	19	313
Northwestern University	280	166	9	2	13	17	-2	..	80	15	584
University of Chicago, The School of Medicine	109	89	8	..	9	10	..	3	13	11	252
University of Illinois	355	172	3	..	9	44	27	2	7	46	665
Indiana University	224	90	..	..	10	25	18	1	10	19	397
State University of **Iowa**	167	98	1	..	7	11	7	..	2	14	307
University of **Kansas**	124	99	17	..	3	10	25	..	3	21	302
University of Louisville (**Kentucky**)	218	80	3	..	20	7	21	1	4	11	365
Louisiana State University	138	90	9	2	4	4	39	8	3	28	325
Tulane University of Louisiana	202	202	9	2	8	14	37	2	22	16	514
Johns Hopkins University (**Maryland**)	125	104	4	..	12	6	33	..	2	23	309
University of Maryland	190	103	9	1	4	9	34	..	3	22	375
Boston University (**Massachusetts**)	139	64	3	..	20	5	6	..	..	11	248
Harvard Medical School	234	190	12	1	11	4	65	..	8	..	525
Tufts College Medical School	190	148	5	1	20	6	22	..	..	18	410
University of **Michigan**	215	186	24	2	16	26	71	..	7	42	589
Wayne University	120	63	8	2	17	7	19	..	..	12	248
University of **Minnesota**	221	138	3	..	5	17	45	..	..	23	452
University of **Mississippi**	24	17	..	..	3	2	9	..	..	3	58
University of **Missouri**	21	32	2	..	2	5	1	..	6	6	75
St. Louis University	277	143	24	1	14	10	62	..	5	..	536
Washington University	173	102	9	1	8	5	41	..	5	23	367
Creighton University (**Nebraska**)	123	64	8	..	4	6	24	..	7	11	247
University of Nebraska	180	82	9	1	8	15	25	..	..	10	330
Dartmouth Medical School (**New Hampshire**)	8	21	..	..	1	1	15	1	..	..	47
Albany Medical College (**New York**)	77	51	..	..	5	9	20	..	2	20	184
Long Island College of Medicine	228	101	7	..	10	7	40	1	3	20	417
University of Buffalo	188	60	4	1	7	34	9	..	2	14	319
Columbia University	208	148	2	..	11	10	52	..	5	27	463
Cornell University	163	93	3	..	7	4	26	..	2	19	317
New York Medical College	177	108	7	2	13	13	71	..	..	43	434
New York University	285	122	7	3	21	7	52	..	1	35	533
University of Rochester	118	81	4	..	13	2	19	..	7	14	258
Syracuse University	107	62	1	1	2	7	7	..	2	10	199
University of **North Carolina**	12	47	1	..	..	5	30	..	..	4	99
Duke University	110	123	5	3	6	7	29	..	2	13	298
Bowman Gray School of Medicine	85	52	1	..	3	6	37	..	..	7	191
University of **North Dakota**	25	15	..	..	2	2	5	..	2	..	51
University of Cincinnati (**Ohio**)	175	66	2	..	13	23	13	..	12	22	326
Western Reserve University	196	72	7	..	12	5	32	..	..	13	337
Ohio State University	169	62	2	..	12	8	34	..	8	16	311
University of **Oklahoma**	168	76	3	..	1	3	17	..	8	11	287
University of **Oregon**	145	71	6	..	7	8	26	..	1	18	292
Hahnemann Medical College (**Pennsylvania**)	280	137	8	..	30	8	75	..	1	38	577
Jefferson Medical College	317	172	..	..	30	14	74	..	..	..	607
Temple University	235	139	1	6	..	..	..	..	84	31	496
University of Pennsylvania	234	159	14	..	14	8	..	..	79	19	527
Woman's Medical College	...	..	..	..	..	..	..	..	..	162	162
University of Pittsburgh	171	68	9	..	30	2	..	..	22	21	323
Medical College of **South Carolina**	104	54	3	1	8	7	23	..	..	3	198
University of **South Dakota**	17	20	..	..	..	1	9	..	..	1	48
University of **Tennessee**	266	112	1	..	6	11	84	..	..	15	495
Meharry Medical College	182	..	3	..	6	14	29	..	3	16	253
Vanderbilt University	100	55	..	..	2	5	26	..	3	8	199
Southwestern Medical College (**Texas**)	89	50	4	1	3	15	13	5	11	14	205
Baylor University	83	95	..	..	6	16	27	1	21	8	257
University of **Texas**	167	133	..	..	1	23	..	..	38	27	389
University of **Utah**	80	37	1	..	1	11	26	..	..	2	158
University of **Vermont**	96	25	..	..	7	1	11	..	..	9	149
University of **Virginia**	108	92	2	..	14	11	25	1	3	9	265
Medical College of Virginia	135	128	3	..	11	9	27	..	2	23	338
West Virginia University	11	17	..	..	1	5	17	..	..	4	55
University of **Wisconsin**	119	90	2	..	1	19	14	2	5	36	288
Marquette University	143	111	3	..	9	40	37	..	..	23	366
Totals	11,339	6,658	353	42	634	738	2,251	30	631	1,352	24,028

education in wartime. Several bills now pending in Congress, and the Vannevar Bush report to the President, propose federal scholarships for medical students in the belief that significant numbers of superior men and women are prevented from obtaining a medical education in normal times for financial reasons. Whether or not this has actually been the case in the organizations, collaborating with the Armed Forces Institute, in which it is proposed to award high school and even college credits to students on the basis of examinations rather than course credits. These plans appear to be well conceived and fully recognize that written examinations cannot measure laboratory performance. It is planned to award credits through

examinations for nonlaboratory courses and for the didactic material in science courses.

Such a program is sound at any time, given adequate comprehensive examinations. It is particularly desirable now, when many veterans should commence academic work at a level commensurate with knowledge and ability rather than at the point dictated by formal course credit.

The awarding of high school credits on the basis of these examinations is entirely in accordance with principles, policies and regulations of the Council. Furthermore, this procedure should not lead to future licensure difficulties, since those states whose laws or practices include high school requirements provide for an alternative "equivalent" of high school work in each instance. Presumably the examinations sponsored by the American Council on Education would constitute such equivalents.

But there is some doubt about the applicability of these examinations as a substitute for premedical nonlaboratory college work under existing regulations. The Council on Medical Education and Hospitals has this problem now under consideration. There should result a common agreement by the Council, the Association of American Medical Colleges and the various state medical licensing boards on this question, so that men and women—particularly veterans—will not be compelled to study formally what they already have mastered. At the same time there must be a full recognition of the fact that an unwarranted leniency in evaluating the qualifications of an applicant for medical school would do no service to the applicant, the medical school or the public.

TABLE 7.—*Military Status of Medical Students in the United States by Classes, 1944-1945*

	Army	Navy	IV-F	Occup. Defer.	Veterans	Under 18	Other Men	Women	Total
Freshmen.....	1,125	1,889	347	1,706	558	29	399	470	6,523
Sophomores..	2,725	2,170	200	384	40	..	120	340	5,979
Juniors.....	3,843	1,320	122	84	21	1	41	268	5,700
Seniors.....	3,999	1,321	69	77	15	..	71	274	5,826
Totals.....	11,692	6,700	738	2,251	634	30	631	1,352	24,028

NEW MEDICAL SCHOOLS

The Medical College of Alabama is not listed among the complete medical schools, because this Educational Number presents data for the period prior to the commencement of junior work in Birmingham. Therefore the school is still listed with the basic science institutions (table 9, page 48) as the University of Alabama School of Medicine under the deanship of Dr. Stuart Graves. The expansion plans of this school appear to be well conceived and sound. Outstanding leadership has been secured for the Birmingham project in the person of Dr. Roy Kracke, formerly of Emory University. Ample clinical facilities under complete control of the school have been secured: the college holds the deeds to the Hillman Hospital and the Jefferson Hospital with about 1,000 beds, almost all of which are for service cases. Funds and land adjacent to the hospital have been secured for the construction of a basic science building, and the budgetary provisions seem to be adequate at least to commence operations. On recommendation of the Council and of the Association of American Medical Colleges, the school has been awarded contracts by the Army and the Navy for third year instruction, which will have begun by the time this issue of THE JOURNAL is published. The school will be surveyed for possible inclusion on the Council's list of approved four year schools when senior instruction is under way.

In Washington State, legislation has passed for the establishment of schools of medicine and dentistry under the Board of Regents of the University of Washington, to be located on the university campus in Seattle. There are appropriations of $450,000 for operation until March 31, 1947 and of $3,750,000 for construction of the plant, including a hospital. The University of Washington has had several medical basic science departments in its graduate school for some time, which can serve as a nucleus for the new institution. Conferences with the school authorities have been held by the secretaries of the Council on Medical Education and Hospitals of the American Medical Association and of the Association of American Medical Colleges. Definite steps toward consummation of the development are awaiting the appointment of a dean.

Other states now operating schools of basic medical sciences (Mississippi, Missouri, North Carolina, North Dakota, South Dakota and West Virginia) are contemplating expansions to the four year status and have at least authorized surveys of the problem, some of which have been completed. South Carolina, which now has an approved four year school at Charleston, appropriated $25,000 to survey medical care in the state and prepare plans for an enlargement of the existing four year medical school and construction of a hospital. Florida, with no medical school at present, has provided $25,000 to conduct a survey into the costs of operating a medical school.

Puerto Rico is projecting a medical school to be operated under the direction of the University of Puerto Rico. Until this institution can be built and put into operation, Puerto Rico has provided funds for scholarships for each of 50 students in each of the next four years, to be awarded to successful applicants to medical schools in this country. Almost all medical schools have indicated a willingness to consider Puerto Rican applicants, with the clear understanding that there is no advance commitment to admit such applicants.

CONSIDERATIONS IN ESTABLISHING A MEDICAL SCHOOL

Unfortunately, some of the current proposals for establishing new medical schools are ill conceived and rest on a failure to understand certain well recognized principles which must guide the thinking about such projects. Some of these considerations, which would seem to be axiomatic, but too often disregarded, are as follows:

1. There is no justification for the establishment of a medical school to meet such an acute temporary emergency as the absence of physicians on military duty.

2. Any overall increased present or postwar need for additional physicians occasioned by the war can be provided by existing approved schools. There is no justification for establishing new medical schools for this purpose. Furthermore, the normal annual number of graduates from existing schools is adequate for the peacetime needs of the country, granted distribution is equitable.

3. The maldistribution of physicians as between the states or between urban centers and rural areas is a problem to be attacked primarily by other means than the production of more doctors in a given state; the rate of production and the distribution of doctors in this country are independent.

TABLE 8.—*Approved Medical Schools in the United States and Canada*

	Name and Location of School	1946 Premedical Requirement by Years#	Students by Classes, 1944-1945						1944 Graduates Not Reported in 1944 Educational Number and 1945 Graduates to June 30, 1945¶	Executive Officer	
			1st Year	2d Year	3d Year	4th Year	5th Year or Intern Year	Totals			
	ARKANSAS										
1	University of Arkansas School of Medicine, Little Rock	60 sem. hrs.	75	65	61	65	..	266	68x	Byron L. Robinson, M.D., Dean	1
	CALIFORNIA										
2	University of California Medical School, Berkeley-San Francisco	3	72	71	69	84	..	296	133	Francis Scott Smyth, M.D., Dean	2
3	College of Medical Evangelists, Loma Linda-Los Angeles	3	96	89	92	94	73†	371	150	Newton G. Evans, M.D., Dean, Loma Linda; W. F. Norwood, Ph.D., Associate Dean, Los Angeles	3
4	University of Southern California School of Medicine, Los Angeles	90 sem. hrs.	65	62	65	62	54†	254	108	Burrell O. Raulston, M.D., Dean	4
5	Stanford University School of Medicine, Stanford University-San Francisco	3	61	58	60	61	59†	240	119	Loren Roscoe Chandler, M.D., Dean	5
	COLORADO										
6	University of Colorado School of Medicine, Denver	3	69	57	56	55	..	237	112	Ward Darley, M.D., Acting Dean	6
	CONNECTICUT										
7	Yale University School of Medicine, New Haven	3	63	65	60	62	..	250	107	Francis G. Blake, M.D., Dean	7
	DISTRICT OF COLUMBIA										
8	Georgetown University School of Medicine, Washington	3	103	92	85	87	..	367	152	David V. McCauley, S.J., Ph.D., Dean	8
9	George Washington University School of Medicine, Washington	2	85	75	83	73	..	316	148	Walter A. Bloedorn, M.D., Dean	9
10	Howard University College of Medicine, Washington	60 sem. hrs.	77	70	68	58	..	273	68x	John W. Lawlah, M.D., Dean	10
	GEORGIA										
11	Emory University School of Medicine, Atlanta	90 sem. hrs.	68	59	65	56	..	248	116	Eugene A. Stead Jr., M.D., Acting Dean	11
12	University of Georgia School of Medicine, Augusta	90 sem. hrs.	78	75	67	65	..	285	124	G. Lombard Kelly, M.D., Dean	12
	ILLINOIS										
13	Loyola University School of Medicine, Chicago	60 sem. hrs.	83	80	70	80	..	313	161	Italo F. Volini, M.D., Dean	13
14	Northwestern University Medical School, Chicago	85 sem. hrs.	135	131	149	169	138†	584	296	J. Roscoe Miller, M.D., Dean	14
15	University of Chicago, The School of Medicine	90 sem. hrs.	65	66	55	66	..	252	117	A. C. Bachmeyer, M.D., Asso. Dean, Biology Div.; F. J. Mullin, Ph.D., Assistant Dean of Students	15
16	University of Illinois College of Medicine, Chicago	88 sem. hrs.	146	157	179	183	..	665	167x	Raymond B. Allen, M.D., Dean	16
	INDIANA										
17	Indiana University School of Medicine, Bloomington-Indianapolis	2	106	105	85	101	..	397	226	Willis D. Gatch, M.D., Dean	17
	IOWA										
18	State University of Iowa College of Medicine, Iowa City	3	79	79	66	83	..	307	153	Ewen Murchison MacEwen, M.D., Dean	18
	KANSAS										
19	University of Kansas School of Medicine, Lawrence-Kansas City	3	73	74	75	80	..	302	164	Harry R. Wahl, M.D., Dean	19
	KENTUCKY										
20	University of Louisville School of Medicine, Louisville	3 & Degree	103	83	91	88	..	365	177	John Walker Moore, M.D., Dean	20
	LOUISIANA										
21	Louisiana State University School of Medicine, New Orleans	90 sem. hrs.	98	75	71	81	..	325	159	Wilbur C. Smith, M.D., Dean	21
22	Tulane University of Louisiana School of Medicine, New Orleans	90 sem. hrs.	123	122	129	140	..	514	131x	Hiram W. Kostmayer, M.D., Dean	22
	MARYLAND										
23	Johns Hopkins University School of Medicine, Baltimore	2	77	75	77	80	..	309	155	Alan M. Chesney, M.D., Dean	23
24	University of Maryland School of Medicine and College of Phys. and Surg., Baltimore	2	96	90	101	88	..	375	182	Robert U. Patterson, M.D., Dean	24
	MASSACHUSETTS										
25	Boston University School of Medicine, Boston	3	67	57	63	61	..	248	114	Charles F. Branch, M.D., Dean	25
26	Harvard Medical School, Boston	2	125	116	143	141	..	525	279	C. Sidney Burwell, M.D., Dean	26
27	Tufts College Medical School, Boston	4	107	103	102	98	..	410	200	Dwight O'Hara, M.D., Acting Dean	27
	MICHIGAN										
28	University of Michigan Medical School, Ann Arbor	90 sem. hrs.	160	145	144	140	..	589	112x	A. C. Furstenberg, M.D., Dean	28
29	Wayne University College of Medicine, Detroit	60 sem. hrs.	65	64	53	66	..	248	136	Hardy A. Kemp, M.D., Dean	29
	MINNESOTA										
30	University of Minnesota Medical School, Minneapolis	3	100	114	116	122	128†	452	245	Harold S. Diehl, M.D., Dean	30
	MISSOURI										
31	St. Louis University School of Medicine, St. Louis	60 sem. hrs.	138	138	124	136	..	536	236	Alphonse M. Schwitalla, S.J., Ph.D., Dean	31
32	Washington University School of Medicine, St. Louis	90 sem. hrs.	89	78	98	102	..	367	199	Philip A. Shaffer, Ph.D., Dean	32
	NEBRASKA										
33	Creighton University School of Medicine, Omaha	60 sem. hrs.	74	56	58	59	..	247	118	Charles M. Wilhelmj, M.D., Dean	33
34	University of Nebraska College of Medicine, Omaha	65 sem. hrs.	95	81	78	76	..	330	163	C. W. M. Poynter, M.D., Dean	34

	NEW YORK										
35	Albany Medical College, Albany	3	52	46	46	40	..	184	79	R. S. Cunningham, M.D., Dean	35
36	Long Island College of Medicine, Brooklyn	3	111	103	100	103	..	417	199	Jean A. Curran, M.D., President and Dean	36
37	University of Buffalo School of Medicine, Buffalo	3	85	80	80	74	..	319	144	Edward W. Koch, M.D., Dean	37
38	Columbia University College of Physicians and Surgeons, New York	3	120	115	* 114	114	..	463	236	Willard C. Rappleye, M.D., Dean	38
39	Cornell University Medical College, New York	3	81	75	81	80	..	317	154	Joseph C. Hinsey, Ph.D., Dean	39
40	New York Medical College, Flower and Fifth Avenue Hospitals, New York	3	127	117	96	94	..	434	183	J. A. W. Hetrick, M.D., President and Dean	40
41	New York University College of Medicine, New York	2	155	120	132	126	..	533	253	Donal Sheehan, M.D., Acting Dean	41
42	University of Rochester School of Medicine and Dentistry, Rochester	2	69	62	65	62	..	258	124	George H. Whipple, M.D., Dean	42
43	Syracuse University College of Medicine, Syracuse	2	56	49	47	47	..	199	93	H. G. Weiskotten, M.D., Dean	43
	NORTH CAROLINA										
44	Duke University School of Medicine, Durham	90 sem. hrs.	76	72	73	77	..	298	148	Wilburt C. Davison, M.D., Dean	44
45	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	90 sem. hrs.	57	41	43	50	..	191	81	C. C. Carpenter, M.D., Dean	45
	OHIO										
46	University of Cincinnati College of Medicine, Cincinnati	3	88	79	78	81	..	326	160	Stanley Dorst, M.D., Dean	46
47	Western Reserve University School of Medicine, Cleveland	3	86	82	82	87	..	337	160	Joseph T. Wearn, M.D., Dean	47
48	Ohio State University College of Medicine, Columbus	3	85	80	73	73	..	311	144	Charles A. Doan, M.D., Dean	48
	OKLAHOMA										
49	University of Oklahoma School of Medicine, Oklahoma City	3	77	68	70	72	..	287	128	Tom Lowry, M.D., Dean	49
	OREGON										
50	University of Oregon Medical School, Portland	82 sem. hrs.	78	71	72	71	..	292	136	D. W. E. Baird, M.D., Dean	50
	PENNSYLVANIA										
51	§Hahnemann Medical College and Hospital of Philadelphia	2	169	152	130	126	..	577	230	William G. Schmidt, Ph.D., Chrm., Fac. Exec. Com.	51
52	Jefferson Medical College of Philadelphia	2	152	146	155	154	..	607	289	William H. Perkins, M.D., Dean	52
53	Temple University School of Medicine, Philadelphia	90 sem. hrs.	135	110	123	128	..	496	237	William N. Parkinson, M.D., Dean	53
54	University of Pennsylvania School of Medicine, Philadelphia	3	135	124	135	133	..	527	268	William Pepper, M.D., Dean	54
55	Woman's Medical College of Pennsylvania, Philadelphia	3	54	40	38	30	..	162	29x	Marion Fay, Ph.D., Acting Dean	55
56	University of Pittsburgh School of Medicine, Pittsburgh	2	86	82	78	77	..	323	155	William S. McElroy, M.D., Dean	56
	SOUTH CAROLINA										
57	Medical College of the State of South Carolina, Charleston	2	60	46	44	48	..	198	96	Kenneth M. Lynch, M.D., Dean	57
	TENNESSEE										
58	University of Tennessee College of Medicine, Memphis	2	161	116	107	111	..	495	182	O. W. Hyman, Ph.D., Dean	58
59	Meharry Medical College, Nashville	2	67	62	60	64	..	253	59x	Murray C. Brown, M.D., Director of Medical Education; Michael J. Bent, M.D., Dean	59
60	Vanderbilt University School of Medicine, Nashville	3 & Degree	49	46	49	55	..	199	107	Ernest W. Goodpasture, M.D., Dean	60
	TEXAS										
61	Southwestern Medical College of the Southwestern Medical Foundation, Dallas	60 sem. hrs.	64	57	37	47	..	205	57x	Tinsley Harrison, M.D., Dean of Faculty; Donald Slaughter, M.D., Dean of Students	61
62	University of Texas School of Medicine, Galveston	90 sem. hrs.	102	87	89	111	..	389	205	Chauncey D. Leake, Ph.D., Vice President and Dean	62
63	Baylor University College of Medicine, Houston	72 sem. hrs.	85	82	51	39	..	257	15x	Walter H. Moursund, M.D., Dean	63
	UTAH										
64	University of Utah School of Medicine, Salt Lake City	3	42	39	39	38	..	158	73	C. E. McLennan, M.D., Chairman, Admin. Com.	64
	VERMONT										
65	University of Vermont College of Medicine, Burlington	3	40	36	37	36	..	149	68	William Eustis Brown, M.D., Dean	65
	VIRGINIA										
66	University of Virginia Department of Medicine, Charlottesville	3	73	59	68	65	..	265	141	Harvey E. Jordan, Ph.D., Dean	66
67	Medical College of Virginia, Richmond	3	80	74	91	93	..	338	170	J. P. Gray, M.D., Dean	67
	WISCONSIN										
68	University of Wisconsin Medical School, Madison	2	70	72	74	72	..	288	128	W. J. Meek, Ph.D., Acting Dean	68
69	Marquette University School of Medicine, Milwaukee	3	96	99	85	86	..	366	84x	Eben J. Carey, M.D., Dean	69
	CANADA										
70	University of Alberta Faculty of Medicine, Edmonton, Alta	3	37	32	*	21	19	109	70	Alan C. Rankin, M.D., Dean	70
71	University of Manitoba Faculty of Medicine, Winnipeg, Man	2	60	59	*	64	55†	183	55x	A. T. Mathers, M.D., Dean	71
72	Dalhousie University Faculty of Medicine, Halifax, N. S.	2	50	40	31	*	43†	121	75	H. G. Grant, M.D., Dean	72
73	Queen's University Faculty of Medicine, Kingston, Ont	1	48	46	*	46	40‡	224	83	G. Spencer Melvin, M.D., Dean	73
74	University of Western Ontario Medical School, London, Ont	2	51	46	37	37	33	204	65	G. E. Hall, M.D., Dean	74
75	University of Toronto Faculty of Medicine, Toronto, Ont	2	149	124	*	130	135‡	657	245	W. E. Gallie, M.D., Dean	75
76	McGill University Faculty of Medicine, Montreal, Que	3	108	105	*	101	..	314	92x	J. C. Meakins, M.D., Dean	76
77	University of Montreal Faculty of Medicine, Montreal, Que	Degree	121	108	*	78	56†	307	47x	Edmond Dubé, M.D., Dean	77
78	Laval University Faculty of Medicine, Quebec, Que	Degree	135	98	106	70	..	409	37x	Charles Vézina, M.D., Dean	78
	Totals		7,307	6,637	5,874	6,373	....	26,581xx	11,074		

These premedical requirements apply to civilian applicants in most instances. All schools will consider completion of the military premedical program, by male applicants on active duty, as fulfilling academic admission requirements.

§ On probation.

† Fifth year (intern) enrolment not included in total column.

* Class will be enrolled in September 1945 under the deceleration program.

‡ Sixth year enrolment: Queen's 44; Toronto 119.

¶ See table 1 for individual school graduation dates.

x One graduating class; figures of other schools are for two graduating classes.

xx Includes 390 in the 5th and 6th years, Canadian schools.

4. Medical education is by far the most expensive form of professional training, requiring an initial outlay and subsequent annual budgets in the early years totaling millions of dollars and not tens or hundreds of thousands. A school whose resources include annual budgets of less than $350,000, independent of the cost of maintenance of the hospital and outpatient departments, is unlikely to conduct a satisfactory program.

5. The operation of an acceptable four year medical school is far more expensive than the conduct of a basic science medical program.

6. The trend toward more full time clinical instructors is so general that any new school commencing with all or nearly all of its staff on a part time basis is already obsolete.

7. The possession of the M.D. degree and the successful practice of medicine do not, in themselves, indicate that a physician is qualified to teach medical students satisfactorily, even in clinical subjects. Volunteer and part time teachers require special training and experience.

8. A hospital well equipped to provide medical care to the people or even satisfactory for internship or residency training is not thereby necessarily satisfactory as a medical school hospital.

9. Medical schools must be so located that there is an ample supply of patients of all kinds, on the one hand, and competent instructors, including specialists, on the other hand.

10. No medical school is worthy of the name which does not carry out some significant research, even though the primary aim of the school is the training of general practitioners.

A failure to observe these generalizations might lead to costly ventures without prospects of accomplishing the ends sought, however desirable those ends may be.

THE MEDICAL CURRICULUM

The present is an ideal time for a reconstruction of the curriculum, since medical education is now in a state of flux. Curricular changes in recent years have been negligible in many if not most medical schools, except for miscellaneous accretions from time to time, sometimes justifiable educationally but too often the consequence of aggressiveness by an instructor who was able to capture a few spare student hours that others had somehow overlooked.

Drastic revisions along the following lines should be made in many institutions:

1. Reduction in scheduled hours in the basic sciences, especially lectures.

2. Provision for free time of students for reading, investigation or the pursuit of special interests. Stimulation of superior students to participate in research.

3. Reduction in the great mass of detail required of students by instructors, possessing no scientific, intellectual or utilitarian value.

4. A closer integration of the basic sciences with one another, in which department autonomy is relegated to its proper position of administrative convenience, and instruction is interdepartmental, emphasizing the human body in health and disease, avoiding the division of the body into its anatomy, its physiology, its pathology, and so on.

5. Closer correlation of basic sciences with the clinical work, so that clinical material is used as a vitalizing aid in the teaching of the sciences, and these in turn are made more significant and useful in clinical medicine.

6. Reduction of didactic and classroom work in the clinical years to the one or two hours a day it warrants.

7. More complete dependence on the case method of clinical instruction, in which the student is an important member of a team solving the problems of diagnosis and therapy in patients studied individually but under adequate supervision by juniors in the wards and seniors in the outpatient departments.

8. A change in faculty attitude toward the clinical student, placing him and his work in a position of greater dignity, so that he does not consider a clinic as a class from 1 to 3 and the writing of his history as a homework assignment. He should be made to feel that he is a physician under supervision and not a schoolboy with classes from 9 to 5.

9. An emphasis on the unknown, and the challenge it presents, equal in importance to the memorizing of textbooks and lectures.

10. The development of research, seminars, discussions and courses in the social and economic aspects of medicine and the distribution of medical care.

TABLE 9.—*Approved Schools of the Basic Medical Sciences in the United States and Canada*

Name and Location of School	1946 Premedical Requirement by Years §	Students by Classes, 1944-1945			Executive Officer
		1st Year	2d Year	Total	
ALABAMA					
1 ‡University of Alabama School of Medicine, University (Tuscaloosa)	96 sem. hrs.	60	54	114	Stuart Graves, M.D., Dean
MISSISSIPPI					
2 University of Mississippi School of Medicine, University	3	29	29	58	B. S. Guyton, M.D., Acting Dean
MISSOURI					
3 University of Missouri School of Medicine, Columbia	60 sem. hrs.	37	38	75	Dudley S. Conley, M.D., Dean
NEW HAMPSHIRE					
4 Dartmouth Medical School, Hanover	90 sem. hrs.	24	23	47	Rolf C. Syvertsen, M.D., Dean
NORTH CAROLINA					
5 University of North Carolina School of Medicine, Chapel Hill	96 sem. hrs.	52	47	99	W. Reece Berryhill, M.D., Dean
NORTH DAKOTA					
6 *University of North Dakota School of Medicine, Grand Forks	3	26	25	51	H. E. French, M.D., Dean
SOUTH DAKOTA					
7 *University of South Dakota School of Medical Sciences, Vermillion	90 sem. hrs	26	22	48	Joseph C. Ohlmacher, M.D., Dean
WEST VIRGINIA					
8 West Virginia University School of Medicine, Morgantown	3	30	25	55	Edward J. Van Liere, M.D., Dean
CANADA					
9 University of Saskatchewan School of Medical Sciences, Saskatoon, Sask.	2	25	†	25	W. S. Lindsay, M.B., Dean

* On probation.
† Class will be enrolled in September 1945 under the deceleration program.
‡ Now operating clinical program at Birmingham; see page 45.
§ These premedical requirements apply to civilian applicants in most instances. All schools in the United States will consider completion of the military premedical program, by male applicants on active duty, as fulfilling academic admission requirements.

Changes of this kind have been made in some areas by some schools. They should be incorporated, along with other reforms, into every curriculum.

APPROVED MEDICAL SCHOOLS

Medical and basic medical science schools in the United States and Canada approved by the Council on Medical Education and Hospitals of the American Medical Association are listed in tables 8 and 9 (pages 46, 47 and 48). These tables indicate the quantitative premedical requirements for civilians. The enrolment by classes, including students in a required fifth year of interning or research, and the total attendance, which does not include such fifth year students, apply to the academic session 1944-1945. For most schools this session commenced in September or October 1944 and terminated in June 1945. In other schools this class is still in session. The number of graduates in the past year to June 30, 1945 is also given. For all but ten schools in the United States and four in Canada (see pages 40 and 41 for names of schools) the figures are for two graduating classes, usually in the fall of 1944 and June of 1945. Figures for the sixth year enrolment in two Canadian schools are given in a footnote.

For each school the name of the dean or acting dean is given. In this column there have been fourteen changes in the past year, with new administrative officers at Colorado, Emory, Louisiana State, Wayne, Mississippi, Dartmouth, Western Reserve, Ohio, Vanderbilt, Utah, Vermont, Western Ontario, McGill and Montreal.

Two basic science schools, North and South Dakota, remain on probation for their two year program. Each of these schools is contemplating expansion to a four year status.

Each year the Council conducts as many surveys of already approved schools as it can. During the past year the findings at one of these, the Hahnemann Medical College in Philadelphia, were such as to place the school on probation. Similar action was taken by the Executive Council of the Association of American Medical Colleges.

A medical school is placed on probation when significant but correctable deficiencies are judged to exist in the educational program. Such an institution remains on the list of approved schools maintained by the Council, with its probationary status indicated by a footnote. Hospitals approved by the Council may appoint graduates of such a school as interns, residents or fellows, and all otherwise qualified students entering or attending a school on probation are considered acceptable to the Council, including for licensure purposes.

The Council will give every assistance to this school in its efforts to improve the educational program sufficiently to warrant a termination of the probation.

ENROLMENTS

Enrolment figures for the 1944-1945 session are given in tables 8 and 9 (pages 46, 47 and 48) and recapitulated in table 10. In the seventy-seven medical and basic science schools in the United States there were 24,028 students studying medicine (excluding students in a required fifth or intern year), which is a insignificant decrease of 638, or 2.6 per cent from the enrolment in the preceding session. The 1944-1945 total is slightly larger (about 2 per cent) than the enrolment (23,529) of the class reported in the 1944 Educational Number.

Enrolment totals for the Canadian schools are likely to be misleading, especially if attempts are made to compare the enrolment figures of successive sessions. The low totals in the "preceding session" (table 10) are due to the deceleration process, which is well under way in Canadian schools. As a result, there have not been two full sessions in Canada during the time when there were two full sessions in the United States. The effects of deceleration in Canada are also indicated in the data on juniors in table 8.

There were 390 students in the fifth and sixth years in Canadian schools, which number is included in the "totals" column of table 8 but not in the "total" column of table 10. Intern students in a required fifth year during the 1944-1945 session numbered 606, in the schools of the United States (452) and Canada (154).

In schools offering the complete four years of work, the five schools in the United States with the highest enrolments were Illinois 665, Jefferson 607, Michigan 589, Northwestern 584 and Hahnemann 577. An additional five schools (Tulane, Harvard, St. Louis, New York University and Pennsylvania) had enrolments over 500. The three schools with the lowest enrolments were Woman's Medical College 162, Utah 158 and Vermont 149. Five other schools in the United States (Albany, Syracuse, Bowman Gray, South Carolina and Vanderbilt) had enrolments of less than 200. In Canada the highest enrolment occurred at Toronto with 657 students in its six year program, and the lowest at Alberta with 109 students in its five year course.

TABLE 10.—*Total Enrolments by Classes in Medical Schools of the United States and Canada for the 1944-1945 Session. Students in the intern year are not included*

	Fresh-men	Sopho-mores	Juniors	Seniors	Total	Total Preceding Session
69 Medical Schools (U. S.)	6,239	5,716	5,700	5,826	23,481	24,011
8 Basic Science Schools (U. S.)	284	263	.....	.....	547	655
Total (U. S.)	6,523	5,979	5,700	5,826	24,028	24,666
9 Medical Schools (Canada)	759	658	174	547	2,138*	947†
1 Basic Science School (Canada)	25	.....	.....	.....	25	24
Total (Canada)	784	658	174	547	2,163*	971†
Total U. S. and Canada	7,307	6,637	5,874	6,373	26,191	25,637

* Does not include 390 in the 5th and 6th years; these are included in the "totals" column of table 8.
† Does not include 598 in the 5th and 6th years.

During the 1944-1945 session there were two basic science schools with more than 75 students enrolled; these were Alabama (114) and North Carolina (99). The lowest enrolment (in the United States) occurred at Dartmouth, with 24 freshmen and 23 sophomores.

Table 11 gives the number of students enrolled in the United States in the four classes and in internships when required for graduation during the past fifteen years.

During the two sessions conducted since that reported in the 1944 Educational Number there were 25,113 students (1944 second session) and 24,480 students (1944-1945) enrolled. Each of these figures is larger than the total for any preceding year since 1931 despite the fact that students in a required fifth internship year have decreased in numbers in recent years. Also in the past fifteen years the largest enrolment in any one class (freshman to senior) occurred in one or another of the last two sessions shown in table 11. There is no doubt that certain schools have enrolled numbers beyond those justified by their resources and facilities. The number of students in a required fifth internship year has remained practically unchanged during the past three academic sessions.

It should be noted that prior to 1942-1943 the totals shown in table 11 are somewhat higher than the sum of the figures in the various classes. This resulted from certain schools being unable to classify their students strictly into the conventional graded classes, freshman to senior.

TABLE 11.—*Students in the United States by Years, Including the Intern Year When Required for Graduation, 1931-1945*

	Preclinical		Clinical		Intern Year	Total
1930-1931	6,456	5,538	5,080	4,908	1,025	23,007
1931-1932	6,260	5,402	4,932	4,885	1,067	23,202
1932-1933	6,426	5,479	5,017	4,948	1,106	23,572
1933-1934	6,457	5,571	4,988	4,937	1,183	23,982
1934-1935	6,356	5,624	5,142	4,905	1,233	24,121
1935-1936	6,005	5,458	5,230	5,020	1,213	23,777
1936-1937	5,910	5,269	5,140	5,158	1,255	23,350
1937-1938	5,791	5,225	4,986	5,036	1,132	22,719
1938-1939	5,764	5,160	4,947	4,921	1,152	22,454
1939-1940	5,794	5,177	4,921	4,894	1,152	22,423
1940-1941	5,837	5,254	4,969	4,849	1,058	22,437
1941-1942	6,218	5,406	5,087	4,942	767	22,798
1942-1943	6,425	5,828	5,278	5,100	639	23,270
1943-1944	6,561	6,071	5,640	5,257	451	23,980
1944 (second session)	6,648	6,140	6,084	5,794	447	25,113
1944-1945	6,523	5,979	5,700	5,826	452	24,480

GRADUATES

The last column of table 8 (pages 46 and 47) gives the 1944 graduates not included in the 1944 Educational Number plus those in 1945 to June 30. These figures are for two graduating classes, usually about September 1944 and June 1945, in all schools except ten in the United States (Arkansas, Howard, Illinois, Tulane, Michigan, Woman's Medical College, Meharry, Southwestern, Baylor and Marquette) and four in Canada (Manitoba, McGill, Montreal and Laval). Therefore, the total of 11,074 graduates in both countries is about double the number graduating in any previous year, because of the accelerated program. The 10,305 graduates from schools in the United States are four times as many as those graduated in 1922. In that year the consequences of reduced wartime freshman enrolments became apparent, as will again be the case three years hence.

TABLE 12.—*Schools, Students and Graduates in the United States, 1905-1945*

	Schools	Students *	Graduates
1905	160	26,147	5,606
1910	131	21,526	4,440
1915	96	14,891	3,536
1920	85	13,798	3,047
1921	83	14,466	3,186
1922	81	15,635	2,529
1923	80	16,960	3,120
1924	79	17,728	3,502
1925	80	18,200	3,974
1926	79	18,840	3,962
1927	80	19,662	4,035
1928	80	20,545	4,262
1929	76	20,878	4,446
1930	76	21,597	4,565
1931	76	21,982	4,735
1932	76	22,135	4,936
1933	77	22,466	4,895
1934	77	22,799	5,035
1935	77	22,888	5,101
1936	77	22,564	5,183
1937	77	22,095	5,377
1938	77	21,587	5,194
1939	77	21,302	5,089
1940	77	21,271	5,097
1941	77	21,379	5,275
1942	77	22,031	5,163
1943	76	22,631	5,223
1944	77	23,529	5,134
1944 (second session)	77	24,666	5,169
1945 (to June 30)	77	24,028	5,136

* Includes figures for schools of the basic medical sciences.

The total students and graduates per academic year in this country since 1905 are indicated in table 12. In this table the 10,305 graduates reported here are separated into the two graduating classes since the Council's last report. For the "1944 second session" classes there were 5,169 graduates and for the "1945 to June 30" classes there were 5,136. Neither of these figures is significantly different from the number of graduates per academic session in the last decade. However, had all four year schools graduated two classes in the past year instead of only 59 out of 69, there would be a considerable increase in the final figure for graduates in table 12. The ten schools having only one graduating class ordinarily graduate about 736 students per session. This number represents approximately the number of additional graduates which will have been produced as a result of increased enrolments in the medical schools of this country, independently of acceleration. For further discussion of the effects of acceleration on the number of graduates see "The Accelerated Program," page 41.

TABLE 13.—*Schools, Students and Graduates by States Excluding Intern Year Students*

	Schools	Students	Graduates
Alabama	1	114	..
Arkansas	1	266	63
California	4	1,161	510
Colorado	1	237	112
Connecticut	1	250	107
District of Columbia	3	956	308
Georgia	2	533	240
Illinois	4	1,814	741
Indiana	1	397	226
Iowa	1	[illegible]	153
Kansas	1	[illegible]	164
Kentucky	1	565	177
Louisiana	2	839	290
Maryland	2	684	337
Massachusetts	3	1,183	503
Michigan	2	837	248
Minnesota	1	452	245
Mississippi	1	58	..
Missouri	3	978	435
Nebraska	2	577	281
New Hampshire	1	47	..
New York	9	3,124	1,465
North Carolina	3	588	229
North Dakota	1	51	..
Ohio	3	974	464
Oklahoma	1	287	128
Oregon	1	292	136
Pennsylvania	6	2,692	1,208
South Carolina	1	198	96
South Dakota	1	48	..
Tennessee	3	947	348
Texas	3	851	277
Utah	1	158	73
Vermont	1	149	68
Virginia	2	603	311
West Virginia	1	55	..
Wisconsin	2	654	212
Totals	77	24,028	10,305

The University of Illinois continues to graduate the largest number of students, with 167 reported for its one class. The three following schools are next, in order of numbers, each graduating two classes: Northwestern 296 (average 148 per class), Jefferson 289 (average 145) and Harvard 279 (average 140). The smallest numbers were graduated from Baylor 15, Woman's Medical College 29, Albany with 79 in two classes averaging 40, and Bowman Gray 81 in two classes averaging 41.

In the nine Canadian medical schools there were 769 graduates, with five of these schools graduating two classes. The greatest number of graduates was from Toronto, with 245 in two classes. The smallest number, 65 in two classes, received degrees from Western Ontario.

STUDENTS AND GRADUATES BY STATES

The seventy-seven medical and basic science schools in this country are located in thirty-six states and the District of Columbia. The numbers of schools, students and graduates in these states are shown in table 13.

Each of five states enrolled more than a thousand students in their schools and graduated (mainly in two classes) more than 500. In order, these states are New York, nine schools, 3,124 students, 1,465 graduates; Pennsylvania, six schools, 2,692 students, 1,208 graduates; Illinois, four schools, 1,814 students, 741 graduates; Massachusetts, three schools, 1,183 students, 593 graduates; California, four schools, 1,161 students, 510 graduates. The twenty-six schools in these five states account for 42 per cent of the entire student enrolment in this country and 44 per cent of the graduates.

Six of the states with basic science schools had no graduates, since there are no four year medical schools in those states. Four states with one school in each had fewer than 100 graduates: Arkansas 63 in one graduating class, Vermont 68 in two classes, Utah 73 in two classes and South Carolina 96 in two classes.

GEOGRAPHIC SOURCES OF FRESHMEN STUDENTS, 1944-1945

In table 14 is indicated the residence of students in the 1944-1945 freshman class of each medical and basic science school in the United States. The actual states in which the out of state students reside are not given, all students residing in states other than that in which their schools are located being grouped together in the column "other states." Included in the table are 6,523 freshmen in the schools of this country and 784 in Canadian institutions, or 7,307 in all. In the United States 46 per cent of all 1944-1945 freshmen came from elsewhere than the state in which they attend school. Almost all, or 2,899 of these 3,037 students, came from other states of the Union. A few (86) came from the territories and possessions of the United States, 13 were from Canada, and from foreign countries there were 39.

A listing of schools admitting more out of state residents than residents of the state in which the school is located would give a false impression of normal policies. Although freshmen are selected by committees of deans, there is little or no selection of specific students by specific schools, or schools by students, especially in the Army Specialized Training Program. As a result, several state schools normally limiting selections almost entirely to residents now find themselves with many out of state residents. No school in this country was without at least one nonresident freshman in this class.

Tulane enrolled the largest number of freshmen (11) from territories and possessions, and the College of Medical Evangelists admitted the most Canadians (8). Freshmen from foreign countries numbered 6 at Tulane and 6 at Michigan.

In the Canadian school freshmen classes there were 784 students, of whom 730, or about 93 per cent, were residents of Canada. In addition there were 30 freshmen from this country and 24 from foreign countries. McGill enrolled the largest number, 25 from the United States and 12 from foreign countries.

There are twelve states in the Union in which no medical or basic science schools are located. These are listed in table 15, which also gives the number of freshmen from each of these states enrolled in medical schools, as well as the number of schools they attended. There were 611 such freshmen, over 60 per cent of whom came from New Jersey and the state of Washington. From New Jersey there were 252 freshmen in forty-four schools. The greatest number, 31, were

TABLE 14.—*Geographic Sources of Freshman Students, 1944-1945*

	Home State	Other State	Territories & Possessions	Canada	Foreign	Total
University of **Alabama**	43	17	..	..	..	60
University of **Arkansas**	30	45	..	..	..	75
University of **California**	46	24	..	1	1	72
College of Medical Evangelists	22	57	4	8	5	96
University of Southern California	55	10	..	..	..	65
Stanford University	42	18	..	..	1	61
University of **Colorado**	47	21	1	..	..	69
Yale University (**Connecticut**)	8	54	1	..	..	63
Georgetown University (**Dist. of Col.**)	10	92	1	..	..	103
George Washington University	21	61	3	..	..	85
Howard University	13	62	1	..	1	77
Emory University (**Georgia**)	34	34	..	..	..	68
University of Georgia	68	10	..	..	..	78
Loyola University (**Illinois**)	43	40	..	..	..	83
Northwestern University	47	84	4	..	..	135
Uni. of Chicago, The School of Med.	22	37	3	1	2	65
University of Illinois	65	80	..	..	1	146
Indiana University	43	63	..	..	..	106
State University of **Iowa**	65	14	..	..	..	79
University of **Kansas**	49	23	..	..	1	73
University of Louisville (**Kentucky**)	46	55	2	..	..	103
Louisiana State University	64	33	1	..	..	98
Tulane University of Louisiana	18	88	11	..	6	123
Johns Hopkins University (**Maryland**)	6	70	..	..	1	77
University of Maryland	48	46	2	..	..	96
Boston University (**Massachusetts**)	34	32	1	..	..	67
Harvard Medical School	25	93	3	1	3	125
Tufts College Medical School	77	30	..	..	..	107
University of **Michigan**	89	60	5	..	6	160
Wayne University	48	16	1	..	..	65
University of **Minnesota**	92	8	..	..	..	100
University of **Mississippi**	10	19	..	..	..	29
University of **Missouri**	29	8	..	..	..	37
St. Louis University	29	105	3	..	1	138
Washington University	48	40	1	..	..	89
Creighton University (**Nebraska**)	15	57	1	..	1	74
University of Nebraska	71	24	..	..	..	95
Dartmouth Med. School (**New Hampshire**)	..	24	..	..	..	24
Albany Med ical College (**New York**)	36	16	..	..	..	52
Long Island College of Medicine	78	33	..	..	..	111
University of Buffalo	45	36	..	2	2	85
Columbia University	58	60	..	..	2	120
Cornell University	35	44	2	..	..	81
New York Medical College	86	41	..	..	..	127
New York University	102	52	1	..	..	155
University of Rochester	25	44	..	..	..	69
Syracuse University	27	27	1	..	1	56
University of **North Carolina**	44	8	..	..	..	52
Duke University	22	54	..	..	..	76
Bowman Gray School of Medicine	39	18	..	..	..	57
University of **North Dakota**	4	22	..	..	..	26
University of Cincinnati (**Ohio**)	68	19	1	..	..	88
Western Reserve University	55	30	1	..	..	86
Ohio State University	78	7	..	..	..	85
University of **Oklahoma**	68	9	..	..	..	77
University of **Oregon**	45	33	..	..	..	78
Hahnemann Med. College (**Pennsylvania**)	102	61	6	..	..	169
Jefferson Medical College	111	39	2	..	..	152
Temple University	70	55	9	..	1	135
University of Pennsylvania	88	47	..	..	..	135
Woman's Medical College	11	42	1	..	..	54
University of Pittsburgh	83	1	2	..	..	86
Medical College of **South Carolina**	52	8	..	..	..	60
University of **South Dakota**	13	13	..	..	..	26
University of **Tennessee**	73	84	2	..	2	161
Meharry Medical College	4	62	1	..	..	67
Vanderbilt University	19	30	..	..	..	49
Southwestern Medical College (**Texas**)	31	33	..	..	..	64
Baylor University	61	23	1	..	..	85
University of Texas	97	5	..	..	..	102
University of **Utah**	33	9	..	..	..	42
University of **Vermont**	15	25	..	..	..	40
University of **Virginia**	52	21	..	..	..	73
Medical College of Virginia	56	23	..	..	1	80
West Virginia University	25	5	..	..	..	30
University of **Wisconsin**	29	41	..	..	..	70
Marquette University	24	65	7	..	..	96
University of Alberta (**Canada**)	..	..	..	37	..	37
University of Manitoba	..	1	..	59	..	60
Dalhousie University	..	1	..	43	6	50
Queen's University	..	..	..	46	2	48
University of Western Ontario	..	..	..	51	..	51
University of Toronto	..	..	..	147	2	149
McGill University	..	25	..	71	12	108
University of Montreal	..	..	..	121	..	121
Laval University	..	3	..	131	1	135
University of Saskatchewan	..	..	..	24	1	25
Totals	3,486	2,929	86	743	63	7,307

in New York University. From Washington there were 122 in thirty-nine schools, with 23 attending Oregon. There were no freshmen from Nevada in the 1944-1945 class.

It is of interest to compare the number of medical students in 1944-1945 freshmen classes in this country

TABLE 15.—*Enrolment of Freshmen Students from States in Which There Are No Medical Schools, 1944-1945*

	Students Enrolled	Number of Schools	School with Greatest Number from State and Number of Students
Arizona	14	11	Southern California (3)
Delaware	10	7	George Washington (2); Cornell (2); Hahnemann (2)
Florida	87	31	Emory (22)
Idaho	34	21	Oregon (6)
Maine	24	14	Tufts (4); Rochester (4)
Montana	16	12	Northwestern (3)
Nevada	..	..	.....
New Jersey	252	44	New York University (31)
New Mexico	8	5	Baylor (3)
Rhode Island	36	19	Univ. of Michigan (7)
Washington	122	39	Oregon (23)
Wyoming	8	6	Northwestern (2); Harvard (2)
Total	611		

per hundred thousand of population from the twelve states without medical schools and from the country at large. In the country at large there were just 5.0 freshmen enrolled per hundred thousand inhabitants, employing the 1940 census figures. Exactly the same ratio applies for the total freshman registration from these twelve states as a group and their population. New Jersey, without an approved medical school of its own, sent 6.0 men or women per hundred thousand of its population to approved medical schools elsewhere. Washington had the even higher ratio of 7.0 per hundred thousand. These figures would seem to indicate that there is no justification for the argument frequently advanced in some states that "we need a medical school in our state because our boys and girls cannot gain admission to out of state institutions." These figures suggest that these students have as great a chance for admission as do those students residing in a state which does have a medical school within its borders. Justification for developing a new medical school must rest on other grounds.

INTERNSHIPS REQUIRED BY SCHOOLS AND STATES

The medical schools requiring the internship for the M.D. degree are listed in table 16. Only six schools in the United States and four in Canada include this

TABLE 16.—*Internship Required by Medical Schools*

United States
College of Medical Evangelists
University of Southern California School of Medicine
Stanford University School of Medicine
Northwestern University Medical School
University of Minnesota Medical School
Duke University School of Medicine *
Canada
University of Alberta Faculty of Medicine
University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
University of Montreal Faculty of Medicine

* Degree not withheld until internship completed.

requirement. There has been no change in this list in the past two years.

In the year 1944-1945 there were 452 students of schools in the United States and 154 students from Canadian institutions, a total of 606, reported as engaged in this work in fulfilment of the internship requirement for the M.D. degree.

Although relatively few schools now require the internship for the M.D. degree, this is required for licensure by twenty-three states, the District of Columbia, Alaska, Hawaii and Puerto Rico. Table 17 lists these states and also indicates the relationship of this requirement to the wartime nine month internship. At least for the emergency period, eight states and Alaska will accept the shortened internship. Twelve states, the District of Columbia and Puerto Rico require an additional three months in a civilian hospital or military service and will withhold the license until this is completed. However, they will permit applicants for licensure to write the examination on completion of the nine month internship. In three states it is necessary to complete the full year of internship, three months of which may be in the military service, before becoming eligible for the licensure examination. Officers desiring licensure in these states (Illinois, New Hampshire and New Mexico) must seek furloughs to take the exami-

TABLE 17.—*Relationship of the Nine Month Internship to Licensure in All States Requiring an Internship*

	Additional Three Months in Civilian Hospital or Military Service Required	
Accepted as Fulfilling Internship Requirement	Will Give Examination at End of Nine Months	Will Not Give Examination Until Completion of Year's Service
Alaska	Alabama [1]	Illinois [2]
Delaware	District of Columbia [1]	New Hampshire
Idaho	Iowa [1]	New Mexico
Michigan [1]	New Jersey [1]	
Montana [1]	North Dakota	
Nevada	Oklahoma [1]	
Pennsylvania [1]	Oregon [1,2]	
West Virginia	Puerto Rico	
Wyoming	Rhode Island [1]	
	South Dakota [1,2]	
	Utah [1,2]	
	Vermont [1]	
	Washington [1]	
	Wisconsin	

Hawaii, which requires an internship for licensure, has not reported on the relationship of this requirement to the shortened internship.

Some states require the internship of graduates of medical faculties abroad and reciprocity or endorsement applicants.

1. Will also give examination on completion of the medical course but withhold license until internship is completed.
2. Military medical service must be in a military hospital.

nations or delay the procedure until after discharge. Four states specifically stipulate that the three months of military service must be in a military hospital to be acceptable.

Some states require the internship of graduates from schools abroad and applicants for reciprocity or endorsement. The licensing boards of Illinois, Michigan, North Dakota, Pennsylvania and Washington require the internship to be a rotating service, while New Jersey recommends this type of service.

Some medical schools and licensing boards maintain their own list of hospitals acceptable for intern training, but the list of approved internships compiled by the Council on Medical Education and Hospitals is generally used. The Veterans Administration has indicated that all educational institutions included on the various approved lists of the Council on Medical Education and Hospitals of the American Medical Association, including medical schools and house officer hospitals, will be acceptable as institutions eligible for the training of veterans under the "G. I. Bill of Rights."

DISTRIBUTION BY SEX

Students in the 1944-1945 academic session and graduates during approximately one year, ending June 30, 1945, are classified according to sex in table 18

for all medical and basic science schools in the United States and Canada. The enrolment was 25,001 men and 1,580 women. Graduates totaled 10,513 men and 561 women. All but six of the eighty-seven schools reported women students. Five of these have not admitted women in recent years: Georgetown, Harvard, St. Louis, Dartmouth and Jefferson. North Dakota, which reported no women in the 1944-1945 classes, has had women students within the past few years. All Canadian schools had women students enrolled.

TABLE 18.—*Distribution by Sex in the United States and Canada, Classes of 1944-1945*

	Students		Graduates	
	Men	Women	Men	Women
University of **Alabama**	107	7	..	..
University of **Arkansas**	256	10	61	2
University of **California**	268	28	118	15
College of Medical Evangelists	353	18	141	9
University of Southern California	245	9	105	3
Stanford University	222	18	114	5
University of **Colorado**	224	13	104	8
Yale University **(Connecticut)**	231	19	99	8
Georgetown University **(Dist. of Columbia)**	367	..	152	..
George Washington University	298	18	136	12
Howard University	258	15	65	3
Emory University **(Georgia)**	242	6	116	..
University of Georgia	273	12	120	4
Loyola University **(Illinois)**	294	19	153	8
Northwestern University	569	15	290	6
Univ. of Chicago, The School of Med.	241	11	113	4
University of Illinois	619	46	159	8
Indiana University	378	19	222	4
State University of **Iowa**	293	14	141	12
University of **Kansas**	281	21	151	13
University of Louisville **(Kentucky)**	354	11	174	3
Louisiana State University	297	28	149	10
Tulane University of Louisiana	498	16	124	7
Johns Hopkins University **(Maryland)**	286	23	135	20
University of Maryland	353	22	171	11
Boston University **(Massachusetts)**	237	11	105	9
Harvard Medical School	525	..	279	..
Tufts College Medical School	392	18	192	8
University of **Michigan**	547	42	105	7
Wayne University	236	12	130	6
University of **Minnesota**	429	23	231	14
University of **Mississippi**	55	3	..	..
University of **Missouri**	69	6	..	..
St. Louis University	536	..	236	..
Washington University	344	23	192	7
Creighton University **(Nebraska)**	236	11	114	4
University of Nebraska	320	10	159	4
Dartmouth Med. School **(New Hampshire)**	47	..	..	..
Albany Medical College **(New York)**	164	20	70	9
Long Island College of Medicine	397	20	187	12
University of Buffalo	305	14	139	5
Columbia University	436	27	223	13
Cornell University	298	19	145	9
New York Medical College	391	43	158	25
New York University	498	35	230	23
University of Rochester	244	14	118	6
Syracuse University	189	10	89	4
University of **North Carolina**	95	4	..	..
Duke University	285	13	144	4
Bowman Gray School of Medicine	184	7	80	1
University of **North Dakota**	51	..	..	..
University of Cincinnati **(Ohio)**	304	22	155	5
Western Reserve University	324	13	150	10
Ohio State University	295	16	139	5
University of **Oklahoma**	276	11	120	8
University of **Oregon**	274	18	135	1
Hahnemann Med. College **(Pennsylvania)**	539	38	215	15
Jefferson Medical College	607	..	289	..
Temple University	465	31	221	16
University of Pennsylvania	508	19	258	10
Woman's Medical College	..	162	..	29
University of Pittsburgh	302	21	147	8
Medical College of **South Carolina**	195	3	94	2
University of **South Dakota**	47	1	..	..
University of **Tennessee**	480	15	176	6
Meharry Medical College	237	16	54	5
Vanderbilt University	191	8	105	2
Southwestern Medical College **(Texas)**	191	14	54	3
Baylor University	249	8	15	..
University of Texas	362	27	192	13
University of **Utah**	156	2	70	3
University of **Vermont**	140	9	64	4
University of **Virginia**	256	9	139	2
Medical College of Virginia	315	23	158	12
West Virginia University	51	4	..	..
University of **Wisconsin**	252	36	120	8
Marquette University	343	23	82	2
University of Alberta **(Canada)**	97	12	64	6
University of Manitoba	166	17	49	6
Dalhousie University	116	5	73	2
Queen's University	212	12	81	2
University of Western Ontario	183	21	60	5
University of Toronto	560	97	230	15
McGill University	282	32	85	7
University of Montreal	291	16	45	2
Laval University	397	12	35	2
University of Saskatchewan	21	4	..	..
Totals	25,001	1,580	10,513	561

There were 561 women graduates from seventy-two of the seventy-eight four year medical schools. Graduates numbered 514 women and 9,791 men in the United States. In Canada there were 47 women graduates and 722 men.

Table 19 shows the distribution of students and graduates in the United States and Canada classified by sex for a period of ten years—actually, eleven academic sessions, two of these having been completed by most schools in the past year. The current (1944-1945) enrolment of women, 1,580, exceeds that of any class in the last decade, although this increase is not yet apparent in the figures for women graduates, per academic session. Women graduates have not changed appreciably in numbers in the past ten years.

TABLE 19.—*Distribution by Sex in the United States and Canada, 1936-1945*

	Students		Graduates	
Year	Male	Female	Male	Female
1935-1936	24,219	1,254	5,388	268
1936-1937	23,787	1,244	5,624	261
1937-1938	23,234	1,307	5,439	252
1938-1939	22,919	1,293	5,290	285
1939-1940	22,903	1,291	5,430	273
1940-1941	22,853	1,308	5,527	310
1941-1942	23,551	1,333	5,397	305
1942-1943	24,183	1,317	5,450	271
1943-1944	25,113	1,379	5,390	267
1944 (Second session)	24,859	1,242	5,385	282
1944-1945 (to June 30)	25,001	1,580	5,128	279

Table 20 gives the percentages of women medical students and graduates in the United States since 1905. For the second academic session reported in this issue, since the 1944 Educational Number, the percentage enrolment of women has risen to 5.6. This is a higher proportion of women enrolled in medical schools than at any other time in the last twenty years. The percentage of women graduates in the past year was equaled or exceeded several times in the past decade.

We may expect increases in the enrolment of women in the next entering classes, with the current limitations on the supply of qualified men. However, it is not apparent that there is a large reservoir of qualified women students interested in and prepared to study medicine. The ratio of women applicants to women accepted in medical schools has been about the same as the ratio for men. Should schools determine to admit a considerably larger proportion of women next year, they would probably be unable to do so without accepting students with qualifications inferior to those required in the past from either men or women.

LOAN FUNDS AND SCHOLARSHIPS

Since about 80 per cent of the students in medical schools are now being financed under the Army and Navy programs, the need for student loans and scholarships has been greatly reduced. At the present time needy and deserving civilian students can probably be

adequately provided for locally. In many instances university and college funds for these purposes have accumulated from lack of demand for them. Such funds should be carefully conserved, because of the likelihood that there will soon be a higher percentage of civilians in our medical schools. Since the accelerated program must be continued to fulfil Army and Navy agreements, financial hardships may be encountered by the increasing number of civilians.

Recently there have been several proposals that federal funds be made available for medical student scholarships. It would be preferable to have such aid made available as loans rather than as outright scholarships, since the practice of medicine is reasonably remunerative. Competent medical students should have sufficient confidence in themselves to be willing to borrow money for their education.

TABLE 20.—*Women in Medicine in the United States*

Year	Women Students	Percentage of All Students	Women Graduates	Percentage of All Graduates
1905	1,073	4.1	219	4.0
1910	907	4.0	116	2.6
1915	592	4.0	92	2.6
1920	818	5.8	122	4.0
1925	910	5.0	204	5.1
1926	935	5.0	212	5.4
1927	964	4.9	189	4.7
1928	929	4.5	207	4.9
1929	925	4.4	214	4.8
1930	955	4.4	204	4.5
1931	990	4.5	217	4.6
1932	955	4.3	208	4.2
1933	1,056	4.7	214	4.4
1934	1,020	4.5	211	4.2
1935	1,077	4.7	207	4.1
1936	1,133	5.0	246	4.7
1937	1,113	5.1	238	4.4
1938	1,101	5.4	237	4.6
1939	1,144	5.4	260	5.1
1940	1,145	5.4	253	5.0
1941	1,146	5.4	280	5.3
1942	1,164	5.3	279	5.4
1943	1,150	5.1	241	4.6
1944	1,176	5.0	239	4.7
1944 (Second session)	1,141	4.6	252	4.9
1945 (to June 30)	1,352	5.6	262	5.1

PART TIME, SPECIAL AND GRADUATE STUDENTS

Part time, special and graduate students are excluded in all of the foregoing tabulations and statistics. Special students include those carrying work in such fields as public health, physicians reviewing for specialty boards examinations and students preparing to become physical therapy or clinical laboratory technicians. Curriculums in these and other fields may involve medical courses.

During the 1944-1945 session there were 129 part time or special students and 140 graduate students enrolled in some of the medical courses in forty medical and basic science schools in this country and Canada. These numbers represent still further decreases below the figures of a year ago. The decreased enrolment of graduate students is another reflection of our national wartime policy of failing to provide for the training of scientists. In 1940-1941 there were 1,167 graduate students in our medical schools. Last year's 140 is only 12 per cent of this number. The Selective Service System and the Army and Navy have insured a deficiency in medical students, in quantity or quality, in the next few months or years. They have also provided for an even more prolonged deficiency in medical school teachers and investigators in the basic sciences.

GRADUATES WITH BACCALAUREATE DEGREES

At the present time no school in the United States requires a degree for admission, although one school (Tufts) requires four years of premedical work. In Canada, Montreal and Laval require the degree. Two schools (Louisville and Vanderbilt) require the student to earn a bachelor's degree during the first year in medical school. Yet 79 per cent of the graduates from seventy-eight four year medical schools in the United States and Canada also held baccalaureate degrees, as shown in table 21. This does not include those earning the B.S. in medicine, who are presented in the next section.

TABLE 21.—*Graduates with Baccalaureate Degrees*

	Graduates	Degrees
University of **Arkansas**	63	13
University of **California**	133	132
College of Medical Evangelists	150	87
University of Southern California	108	82
Stanford University	119	119
University of **Colorado**	112	104
Yale University **(Connecticut)**	107	103
Georgetown University **(Dist. of Columbia)**	152	137
George Washington University	148	109
Howard University	68	61
Emory University **(Georgia)**	116	100
University of Georgia	124	106
Loyola University **(Illinois)**	161	75
Northwestern University	296	290
University of Chicago, The School of Medicine	117	112
University of Illinois	167	144
Indiana University	226	189
State University of **Iowa**	153	116
University of **Kansas**	164	161
University of Louisville **(Kentucky)**	177	110
Louisiana State University	159	96
Tulane University of Louisiana	131	96
Johns Hopkins University **(Maryland)**	155	152
University of Maryland	182	131
Boston University **(Massachusetts)**	114	103
Harvard Medical School	279	247
Tufts College Medical School	200	184
University of **Michigan**	112	92
Wayne University	136	134
University of **Minnesota**	245	245
St. Louis University **(Missouri)**	236	177
Washington University	199	168
Creighton University **(Nebraska)**	118	113
University of Nebraska	163	88
Albany Medical College **(New York)**	79	69
Long Island College of Medicine	199	167
University of Buffalo	144	68
Columbia University	236	209
Cornell University	154	154
New York Medical College	183	164
New York University	253	226
University of Rochester	124	104
Syracuse University	93	76
Duke University **(North Carolina)**	148	20
Bowman Gray School of Medicine	81	70
University of Cincinnati **(Ohio)**	160	140
Western Reserve University	160	158
Ohio State University	144	138
University of **Oklahoma**	128	64
University of **Oregon**	136	136
Hahnemann Medical College **(Pennsylvania)**	230	174
Jefferson Medical College	289	289
Temple University	237	206
University of Pennsylvania	268	232
Woman's Medical College	29	28
University of Pittsburgh	155	125
Medical College of **South Carolina**	96	79
University of **Tennessee**	182	57
Meharry Medical College	59	50
Vanderbilt University	107	107
Southwestern Medical College **(Texas)**	57	35
Baylor University	15	12
University of Texas	205	108
University of **Utah**	73	64
University of **Vermont**	68	68
University of **Virginia**	141	113
Medical College of Virginia	170	156
University of **Wisconsin**	128	128
Marquette University	84	61
University of Alberta **(Canada)**	70	62
University of Manitoba	55	24
Dalhousie University	75	27
Queen's University	83	19
University of Western Ontario	65	8
University of Toronto	245	53
McGill University	92	77
University of Montreal	47	45
Laval University	37	37
Totals	11,074	8,783

In the United States 8,431 (or 80 per cent) of the 10,305 medical graduates also held bachelor's degrees and in Canada 352 (or 45 per cent) of the 769 medical graduates also held the additional degree. All the graduates of eight schools (Stanford, Minnesota, Cor-

nell, Oregon, Jefferson, Vanderbilt, Vermont and Wisconsin) held both degrees. Likewise, all the graduates of Laval held both degrees.

GRADUATES WITH THE B.S. IN MEDICINE

There were 218 graduates of medical schools in the United States in 1944-1945 who also at some point during their medical course received a bachelor's degree referred to as a B.S. in medicine. Certain of the graduates of eleven medical schools received this degree. The largest single group to receive the degree were 45 graduates of the University of Texas. Northwestern awarded 34 and Western Reserve 33. Other schools granted fewer than 30 and three schools less than 10. None of the graduates of Canadian medical schools in 1944-1945 obtained this degree.

FEES

The eighty-seven medical schools and basic science schools in the United States and Canada have been arranged in five groups in table 22 according to the tuition fees charged resident students for the session 1944-1945. The data are based on the average tuition fee charged for the complete medical course and includes such minor charges as those for matriculation, breakage, diploma and graduation.

There is a continuous upward trend in tuition fees. No school now charges less than $100 for the year. The average tuition fee charged by medical schools in the past five years has increased from $378 in 1940 to $415 in 1945.

Thirty-three schools in the United States and five in Canada make an additional charge for nonresidents. The Army and Navy pay nonresident fees for their students. These sums vary considerably in amount. Toronto charges $5 for the first year students and $10 for others. Three schools charge $50 or less annually. Three schools have nonresident tuition fees of $350 or more: Oklahoma $350, Louisiana State $400 and Georgia $445.

TABLE 22.—*Fees, 1944-1945*

	Number of Schools
$100 to 199	8
200 to 299	19
300 to 399	13
400 to 499	13
500 or over	34
Total	87

APPROVED INTERNSHIPS AND RESIDENCIES FOR VETERAN AND CIVILIAN PHYSICIANS

As the time approaches when greater numbers of medical officers will be returned to civilian life, it is becoming increasingly important that the medical profession and hospitals continue their efforts to maintain and develop adequate facilities and opportunities for the continued training of veteran and civilian physicians. Much has already been accomplished; studies carried out by the Council on Medical Education and Hospitals in collaboration with the Committee on Postwar Medical Service indicate that the required number of educational programs have now been developed in several fields. Other services, however, will require further expansion to meet the anticipated need of the postwar period.

Under normal peacetime conditions the approved hospitals in the United States provide opportunities for approximately 5,300 residents. After the war emergency this number will be augmented by a large group of medical officers who have recently indicated their desire for further residency training. From the initial report on Results of Pilot Questionnaire to Physicians in Service [1] it was estimated [2] that 10,260 medical officers would request full time educational assignments of more than six months' duration. This estimate has since been revised in view of the more recent report on Postgraduate Wishes of Medical Officers,[3] in which it was indicated that 12,534 desire more than six months' training. Combining this figure with the normal civilian complement of 5,256 residents as reported in 1941, it might appear that hospitals may be called on to furnish a total of 17,790 residencies in the immediate postwar period. Since available services totaled 5,796 in 1943, the number of additional residencies required would be 11,994, assuming that rapid demobilization occurs. If considerable time is required, however, it has been estimated that 5,727 additional places will be needed to supplement the facilities regularly available. Compared with 1943 the total requirement of 11,523 represents an increase of approximately 100 per cent in the number of residencies necessary for veteran and civilian needs.

The extent to which educational facilities have already been expanded is illustrated in table 23, which represents approved internships and residencies within the continental limits of the United States, not including the training programs of army and naval hospitals. This table, which classifies the educational services by states and specialties, contains also comparative data for 1943 as well as the estimated number of residencies required for postwar training. Here the cooperation of hospitals is readily apparent in the reported increase of approved residencies to 7,625 as compared with 5,796 in 1943. This is an expansion of 32 per cent since 1943, but it also represents an increase in available facilities of 45 per cent if compared with the normal prewar number of residents in approved hospitals. In relation to the total requirement of 11,523, however, the present available facilities constitute 66 per cent, or two thirds of the estimated needs.

The required expansion of residencies in specialties is not uniform in all fields. Comparing the estimated total in table 23 with the available facilities in 1943, it will be found that an increase of 122, 132 and 137 per cent may be required in obstetrics-gynecology, dermatology and surgery respectively, 55 to 84 per cent in anesthesia, radiology, pediatrics, urology, ophthalmology-otolaryngology, orthopedics and internal medicine, and 23, 36 and 41 per cent in neurologic surgery, psychiatry and neurology, and pathology. In the mixed residency or general review group, where the anticipated increase is 458 per cent, it is necessary to take into consideration that a large part of this demand will probably be absorbed by the approved internship hospitals which are likewise accredited for mixed resi-

1. J. A. M. A. **125**: 558 (June 24) 1944.
2. J. A. M. A. **126**: 254 (Sept. 23) 1944.
3. J. A. M. A. **127**: 759 (March 31) 1945.

dencies. Plastic surgery records a required expansion of 650 per cent, but the actual number of services is small and may involve training in some of the related surgical fields.

From the number of available residencies in table 23 it is apparent that the estimated requirements in anesthesia, neurologic surgery, pathology and psychiatry and neurology can practically be fulfilled by the expansion of residencies already reported in approved hospitals. Obstetrics-gynecology, dermatology and surgery seem to require a further expansion of 74, 55 and 79 per cent in comparison with present facilities. In medicine the needed expansion is now 46 per cent, ophthalmology-otolaryngology 43, orthopedics 34, pediatrics 30, radiology 20 and urology 26 per cent. It should be noted that many of the hospitals approved for residency training have not yet developed their educational service to full capacity and are therefore in position to organize new training programs or effect further expansion of residencies already approved. Internship hospitals which have not previously engaged in residency training are also in many instances developing satisfactory educational programs in response to the increased need of the postwar period. All approved intern and residency hospitals have been asked to indicate the extent to which educational services can be expanded in accordance with available clinical and teaching facilities. Approximately 30 per cent have now replied, and their reports on the expansion of approved residencies are included in the present discussion. Counting also the new services under consideration, it is probable that this group may be able to provide altogether a total of 2,382 additional residencies.

A new list of Approved Residencies and Fellowships for Veteran and Civilian Physicians has recently been prepared. These services, investigated and approved by the Council, are considered in position to furnish acceptable residency training in accordance with standards adopted by the American Medical Association. In practically all fields these training programs have been reviewed in collaboration with the respective specialty boards. The list includes also the expanded number of residencies now available in those approved hospitals which have completed their plans to provide further opportunities for returning medical officers. Many additional residencies recently organized or in process of development may soon be added to the approved list. Thus there is every indication that, with the continued cooperation of hospitals and medical staffs, adequate graduate educational facilities will be available to all medical officers who desire further training after discharge.

TABLE 23.—*Approved Internships, Assistant Residencies and Residencies—1945*

	Number of Internships	Number of Assistant Residencies and Residencies *																
		Mixed	Anes.	Derm. Syph.	Int. Med.†	Neur. Surg.	Ob. Gyn.	Oph. Otol.	Orth. Surg.‡	Path.	Ped.	Phys. Med.	Plas. Surg.	Neur. Psy.	Rad.	Surg.¶	Uro.	Totals
Alabama	51	16	..	..	7	..	5	..	2	3	4	..	..	..	..	9	2	48
Arizona	9	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Arkansas	25	2	..	..	2	..	..	..	..	..	..	..	..	..	..	2	..	6
California	528	22	7	6	94	9	27	26	21	21	25	2	..	29	19	68	14	390
Colorado	68	6	..	..	17	..	..	2	4	1	7	..	..	13	2	4	..	56
Connecticut	175	5	14	..	24	2	8	3	5	10	7	..	..	25	5	19	2	129
Delaware	29	..	..	..	..	..	..	..	1	..	..	..	..	4	..	3	..	8
District of Columbia	134	..	..	2	41	..	21	8	6	12	18	..	..	15	5	33	2	163
Florida	59	1	..	..	5	..	..	..	..	..	..	..	..	..	1	6	1	14
Georgia	103	..	3	..	18	..	13	6	3	6	10	..	..	..	2	24	4	89
Idaho	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Illinois	649	12	19	5	89	9	66	71	29	53	46	4	..	38	29	74	11	555
Indiana	159	7	6	..	15	..	5	6	3	10	3	..	..	11	8	11	1	86
Iowa	56	2	9	4	13	..	11	17	10	3	5	..	..	10	9	24	5	122
Kansas	48	..	2	..	5	..	4	1	1	3	1	..	..	8	2	5	..	32
Kentucky	69	2	2	..	12	..	5	2	4	2	5	..	..	..	..	21	..	55
Louisiana	250	6	3	10	35	..	22	38	20	11	13	..	..	10	10	30	10	218
Maine	22	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1
Maryland	279	2	..	..	70	3	42	20	6	13	16	..	..	43	8	79	3	305
Massachusetts	397	25	21	5	104	10	19	20	11	20	13	..	..	63	21	81	11	424
Michigan	351	18	2	10	137	2	40	31	11	15	28	..	..	44	21	111	17	487
Minnesota	137	12	13	14	149	9	20	28	21	15	18	6	4	14	18	154	15	510
Mississippi	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	1	..	4
Missouri	314	2	..	1	73	2	27	30	7	12	24	..	..	26	9	68	8	289
Montana	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nebraska	52	3	..	..	1	..	3	..	2	2	..	..	..	8	3	3	..	25
Nevada	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
New Hampshire	8	4	..	..	..	..	..	..	..	2	..	..	..	1	1	..	..	8
New Jersey	393	..	8	..	24	..	20	10	10	4	3	..	..	10	1	14	9	113
New Mexico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
New York	1,642	19	59	29	328	21	138	150	67	84	108	..	3	226	75	298	50	1,655
North Carolina	117	8	..	3	21	..	10	10	5	19	8	..	..	14	11	37	9	155
North Dakota	3	3	..	..	1	..	..	..	..	..	1	..	..	..	..	1	..	6
Ohio	455	9	3	10	149	7	37	21	12	33	47	..	..	28	26	139	13	534
Oklahoma	44	..	3	..	3	..	4	2	10	3	1	..	..	..	1	4	..	31
Oregon	65	..	3	5	5	..	3	4	6	6	3	..	..	2	5	8	3	53
Pennsylvania	773	..	8	11	68	4	39	34	15	39	36	..	1	49	39	69	8	420
Rhode Island	44	..	1	..	3	..	..	..	2	2	..	..	..	14	..	..	..	22
South Carolina	42	..	..	..	4	..	4	..	5	..	3	..	..	..	2	6	..	24
South Dakota	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tennessee	136	2	..	..	22	1	16	7	10	7	10	..	..	..	5	23	..	103
Texas	190	6	3	..	22	..	13	5	4	3	13	..	..	3	7	31	1	111
Utah	35	..	..	..	6	..	..	..	..	..	..	..	..	..	..	2	..	8
Vermont	8	..	..	..	2	..	..	..	..	2	..	..	..	..	2	2	..	8
Virginia	120	15	..	7	22	10	10	17	9	2	8	..	..	10	10	35	6	161
Washington	116	2	..	..	6	..	1	2	1	1	1	..	..	11	1	12	..	38
West Virginia	40	8	..	..	6	..	1	..	..	2	..	..	..	..	..	10	..	27
Wisconsin	158	4	9	..	29	..	8	8	9	6	11	..	..	13	6	22	5	130
Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals (1945)	8,360	225	198	122	1,636	89	642	579	332	427	496	12	8	742	364	1,543	210	7,625
Estimated total postwar residencies required		859	199	100	2,391	74	1,119	828	444	437	642	..	45	748	436	2,756	264	11,523x
Residencies in 1943		154	128	82	1,302	60	504	471	243	311	389	..	6	548	281	1,161	156	5,796

x. Includes 91 residencies in other fields. * Includes fellowships. † Includes cardiology, communicable diseases and tuberculosis.
‡ Includes fractures. ¶ Includes malignant diseases, thoracic surgery and traumatic surgery.

The residency list as well as the newly prepared list of Approved Internships will be included in the reprint edition of the Educational Number and will be given wide distribution to medical schools, state boards of medical examiners, specialty boards and other agencies. Lists will also be available to medical officers and other physicians on request.

The intern list contains the names of 734 institutions exclusive of army and naval hospitals. Under normal peacetime conditions these institutions would be able to accommodate 8,360 interns. Prior to the war most of these positions would have been filled even though the annual graduating class of medical students did not exceed 5,500. Nearly 2,300 places, it should be noted, were occupied by interns who remained for a second year of service or held an original internship appointment of more than twelve months. In the postwar period it is anticipated that most of the internships will continue as one year assignments followed by assistant residencies and residencies for those who desire further hospital training. Thus there is ample assurance that sufficient facilities will be available to returning medical officers who may wish to obtain an internship, supplement their previous nine months training or secure advanced assignments as second year interns or general resident physicians. All internship hospitals approved by the Council are likewise accredited for general or mixed residencies.

POSTGRADUATE CONTINUATION COURSES FOR VETERAN AND CIVILIAN PHYSICIANS

While many scientific meetings and other programs of graduate medical education were canceled at the request of the Office of War Mobilization, nevertheless the Council on Medical Education and Hospitals has been able to provide a great deal of information regarding opportunities available for postgraduate study. An analysis of questionnaires returned by 21,029 medical officers concerning their postgraduate [1] wishes indicates that approximately 20 per cent of the group will desire short term refresher and review courses of less than six months' duration. The studies of the Council on Medical Education and Hospitals indicate that greatly expanded facilities will be available for this type of training for both veteran and civilian physicians but that there is an acute need to provide full time courses of about three months' duration. Reports from medical schools, hospitals, medical societies and other agencies give assurance of continued expansion of educational programs in anticipation of postwar needs. The demand for all facilities for instruction is greater than it has ever been. The individuals who will give or have given so generously of their time to participate in the instructional programs constitute a large and distinguished faculty of medicine. The efforts of individual physicians with their increasing personal responsibilities and institutions and other agencies with greatly depleted staffs to assist in the presentation of these opportunities is noteworthy.

The Council on Medical Education and Hospitals publishes semiannually advance information concerning postgraduate continuation courses. These include courses in a wide variety of fields in clinical medicine and the basic sciences. The courses are for variable periods from a few days to several months. Some are concentrated full time courses and others are part time. In THE JOURNAL for July 7, 1945 there were listed 493 courses which will be offered during the period July 1, 1945 to Jan. 16, 1946. Many of these courses are not scheduled for any definite date, are arranged to suit the convenience of the physician student and may be repeated throughout the year. Therefore the 493 opportunities listed represent many course sessions beyond this number. The analysis by Colonel Lueth [1] indicated that one of the most acute needs for expansion of postwar educational opportunities pertained to full time review and refresher courses of about three months' duration.

During the current six months 162 additional courses have been arranged as compared with the compilation of such opportunities for the first half of the current year. The courses listed in the July 7 issue of THE JOURNAL [2] are offered by hospitals, medical schools, graduate medical schools or other agencies in twenty-six states and include forty-two specialty or subspecialty subjects. There appears to be adequate geographic distribution. Institutions offering continuation courses for veteran and civilian physicians are invited to announce such courses in these semiannual lists compiled by the Council.

It should be noted that these opportunities are offered in addition to the noteworthy in-service plans being formulated by the Army and the Navy.

In the following paragraphs mention is made of some of the recent and noteworthy developments in postgraduate education. An analysis of the courses offered during the period July 1, 1944 to June 30, 1945 is also presented.

RECENT DEVELOPMENTS

The three month full time courses being developed in a number of medical schools will fulfil a great demand from physician veterans who will wish an intensive review. Especially appropriate courses of this kind have recently been organized by the medical schools of the universities of Wisconsin, Illinois and Iowa.

Courses varying from three days to three weeks conducted wholly or on an individual basis are offered by the California Tuberculosis and Health Association. The instruction covers clinical diagnosis and treatment of tuberculosis. Two institutes are being planned for the fall of 1945 for physicians on the reading of miniature films. The course as planned will run five days in Los Angeles and five days in San Francisco.

The Department of Medicine of the Graduate School of the University of Florida, in conjunction with the Florida Medical Association and the State Board of Health, presented its Thirteenth Graduate Short Course for doctors of medicine June 25-30 with a total attendance of 202, consisting of both civilian physicians and physicians in the armed forces.

The Cook County Graduate School of Medicine has plans to accommodate returning medical officers by offering its large variety of courses at more frequent intervals. The length of the courses varies from two weeks to six months. A total of 1,114 physicians were in attendance at this institution during the last year.

1. J. A. M. A. **127**: 759 (March 31) 1945.

2. J. A. M. A. **128**: 751 (July 7) 1945.

The extension courses of the Kentucky State Medical Association provide for lectures to physicians at various places in the state.

The University of Michigan Department of Postgraduate Medicine is completing plans for three courses of two months each, probably continuing throughout the year, for returning medical officers especially.

The training program conducted since January 1942 in the Mayo Clinic under the auspices of the Mayo Foundation for Medical Education and Research has been temporarily discontinued. During the time these three months' courses have been in effect in the various fields over 1,200 officers have been assigned to them by the Army, Navy and Public Health Service. Pending the reestablishment of a postgraduate program at the Mayo Clinic, physicians are welcome to attend clinics, lectures and seminars any time for as long as they wish to remain.

At the Center for Continuation Study at the University of Minnesota a number of refresher courses have been given. The state department of health participated in many of these courses.

A total of 872 physicians enrolled in the New York Post-Graduate Medical School from July 1, 1944 to June 30, 1945. A considerable number of them enrolled for more than one course, as is shown by the fact that the number of registrations totaled 1,130. A number of new courses have been organized for the coming year which will be of particular interest and value to returning medical officers. Preparations are being made to accommodate as many as the physical facilities of the school will permit.

The annual summer graduate course in ophthalmology under the auspices of the University of Rochester School of Medicine and Dentistry, which was discontinued several years ago, was resumed this year.

The North Carolina State Board of Health sent 25 practicing physicians for two weeks' stay at the Southern Pediatric Seminar at Saluda, N. C., in July of this year. Funds for these scholarships were provided by the United States Children's Bureau. This group conducted its twenty-fifth annual seminar this year.

The Pennsylvania Tuberculosis Society offers three scholarships to practicing physicians in the state for the course at the Trudeau School of Tuberculosis. This consists of a six weeks postgraduate course at the Trudeau School at Saranac Lake, N. Y. It is the purpose of the Pennsylvania Tuberculosis Society in offering these scholarships to afford physicians in general practice in communities more or less distant from the metropolitan centers and who have not had special training or experience in tuberculosis opportunity to obtain training.

The Graduate Medical Course in caudal analgesia offered at the Philadelphia Lying-In Hospital is to be transferred to the University of Tennessee College of Medicine at Memphis in October 1945. The reason for this transfer is to provide more clinical material for increasing enrolments. The course will cover a period of two weeks and will be given continuously. In the past two and one-half years during which this course has been in operation in Philadelphia, 550 physicians from forty-four states and twenty-nine foreign countries have been trained.

Five courses have been arranged for periods of ten days to six months at the Institute for the Control of Syphilis of the University of Pennsylvania.

The Southwestern Medical College at Dallas, Texas, is prepared to offer two postgraduate courses, each of two months' duration. In addition, the Dallas Southern Clinical Society plans to conduct brief courses of one to two weeks' duration.

The Virginia Society of Ophthalmology and Otolaryngology sponsors a short postgraduate course each December, given in the even years at the University of Virginia School of Medicine at Charlottesville and in the odd years at the Medical College of Virginia in Richmond.

Courses of twelve weeks designed especially for the men who are returning from service who are not interested in the specialties are offered by the University of Wisconsin Medical School. Clinics in four cities were offered in the spring of 1945 by the State Medical Society of Wisconsin. More than 200 physicians attended these clinics.

A survey is being conducted by the American Gastroenterological Association with a view to sponsoring postgraduate work for the returning medical officers.

It was necessary to cancel the annual postgraduate medical teaching venture sponsored by the Inter-State Post-Graduate Medical Association, which draws an attendance of several thousand. Likewise the 1945 Clinical Congress of the American College of Surgeons, as well as its War Sessions, which last year attracted 17,000 physicians, were canceled.

The American Academy of Ophthalmology and Otolaryngology is again offering a home study course in ophthalmology or otolaryngology. The value of these home study courses is recognized by the specialty boards, and registrants are recommended for residencies and candidates for board certification, although it is specifically understood that completion of the academy courses does not necessarily fulfil the requirements of the boards for fundamental training.

The excellent opportunities outlined are mentioned to present the variability of the courses being offered throughout the country. THE JOURNAL for July 7, 1945 presents these and many others in detail. Such institutions as Tulane, Hopkins, Harvard, Tufts, New York Eye and Ear Infirmary, the New York Medical College, the New York Polyclinic and the University of Pennsylvania are continuing to offer organized courses. These examples emphasize the fact that, even though the staff physicians of all institutions are sorely taxed, they have been able to develop or continue opportunities for graduate education.

ANALYSIS OF COURSES OFFERED, 1944-1945

In presenting this analysis of postgraduate courses which have been offered during the annual period July 1, 1944 to June 30, 1945 the statistical summaries are divided into three groups: courses in which instruction was offered to physicians in or near their home communities, courses providing ample facilities for clinical instruction and, lastly, a group including clinical conferences, graduate assemblies, study courses and so forth.

Five states (Kentucky, Michigan, Minnesota, Oklahoma and Wisconsin) provided opportunities for physicians to continue professional study in or near their home communities. Subjects of these courses included general medicine, industrial health, neurology and psychiatry, ophthalmology, otolaryngology, pediatrics, poliomyelitis and surgery.

Agencies which were active participants in providing these opportunities, either independently or jointly,

included state and county medical societies in Kentucky, Michigan, Oklahoma and Wisconsin, the two medical schools in Michigan and the American Academy of Ophthalmology and Otolaryngology. Other agencies included the state departments of health in Michigan and Oklahoma, the Commonwealth Fund and the Horace H. and Mary A. Rackham Fund.

The courses varied in length from one day sessions to courses extending over nine months. There was a total of eight courses given. The type of instruction given was both didactic and clinical. Two courses were home study in nature. The instructors were chosen from physicians practicing in the state in which the courses were offered as well as from out of state men. Fees ranged from $1 to $9, while for two courses no fee was charged.

The attendance reported for these eight courses was 2,365. The attendance for such opportunities in 1944 was 3,955 for courses in eight states. Transportation and other difficulties greatly curtailed the sponsoring of these courses itinerant in nature, but nevertheless the value of this type of instruction should not be underestimated.

In centers where ample clinical facilities are available, 618 graduate courses of less than one year's duration were offered in twenty-three states and the District of Columbia. These states and the number of courses which were given in each during 1944-1945 are as follows:

Alabama	1	Iowa	1	North Carolina	1
Arkansas	4	Kansas	2	Oregon	1
Colorado	1	Louisiana	9	Ohio	1
Dist. of Columbia	13	Massachusetts	34	Pennsylvania	14
Florida	1	Michigan	15	South Carolina	2
Georgia	1	Minnesota	9	Texas	4
Illinois	185	Mississippi	1	Virginia	2
Indiana	1	New York	302	Wisconsin	13

While the majority of the courses were in various subjects as the demand seemed apparent, specific courses in general medicine were offered in forty-eight instances, neurology and psychiatry in forty-five, ophthalmology in thirty-nine, general surgery in thirty, obstetrics and gynecology in twenty-six, cardiology in seventeen, dermatology and syphilology, gastroenterology and otolaryngology in fifteen, electrocardiography in twelve and allergy in eleven. Ten courses or fewer were offered in anatomy, anesthesia, arthritis, bronchoscopy, cystoscopy and endoscopy, diabetes, diseases of the chest, electroencephalography, endocrinology, fractures, gastroscopy, gonioscopy, hematology, industrial medicine, legal medicine, neurosurgery, orthopedics, otology, pathology, pediatrics, physical medicine, poliomyelitis, proctology, public health, radiology, therapy, tropical medicine and urology.

Sixty-six agencies or combinations of agencies participated in the planning of the program. Three graduate schools of medicine played the most prominent part in offering courses of this nature. Of the medical schools of the country, seventeen have given courses for practicing physicians during the year. Two state medical associations, five state boards of health and three city or county medical societies made contributions. In nine instances hospitals were the agencies offering short periods of study. Other agencies included three special societies, the American College of Physicians, the United States Public Health Service, Research and Study Club of Los Angeles, Catholic University of America, Institute for Psychoanalysis, Chicago, Boston Psychoanalytic Institute, New York Academy of Medicine, Edward L. Trudeau Foundation, University of North Carolina School of Public Health, Philadelphia Psychoanalytic Institute, Texas Academy of Science, Department of Medicine of the Graduate School of the University of Florida, Southern California Medical, Dental and Pharmaceutical Association, Rockefeller Foundation, Topeka Institute for Psychoanalysis, Commonwealth Fund, Harrington Fund, Lillia Babbit Hyde Foundation, Lasker Foundation, William Buchanan Foundation and Horace H. and Mary A. Rackham Fund. Columbia University, through the New York Post-Graduate Medical School and affiliated hospitals, offered the greatest number of courses.

The length of these courses varied from seven and one-half hours to twenty-four weeks for 323 courses. Ninety-five courses were full time opportunities ranging from one month to six months. Of the remaining 200 courses, 156 did not specify the length of the course, 20 were arranged courses, length not specified. There was a three year course and two courses of a year in length. The remainder specified the length of the course in semesters or quarters.

The description of these intensive courses gave evidence that the type of instruction was both clinical and didactic. In presenting postgraduate courses, medical school facilities were used for 405 courses, hospitals for 264 and clinics for 198. In many instances two or all three of these sources were used in presenting an individual course. Hotels and other facilities were used for 35 courses. The faculties of the medical schools served as instructors in 462 courses. Additional instructors were specialists in their fields chosen mainly from physicians residing within the state in which the course was given but including as well physicians from outside the state.

Courses were offered during every month last year, and in 69 instances they were arranged to suit the convenience of physician-students. There were 115 courses available for specialists only. Fees varied considerably, ranging from $1 to $800. For 14 courses no fee was charged. No fee was charged medical officers in 12 other courses.

The attendance reported for 611 of the 618 courses given last year was 9,833. In 1944 the attendance for 364 such courses was 8,888. As has previously been stated, 493 opportunities are being offered for the period July 1, 1945 to Jan. 16, 1946. Many of these have but recently been organized for the benefit of returning medical officers. If all physicians desiring further training are able to take advantage of the opportunities being offered, it can be estimated that the attendance for 1945-1946 will double that reported this year.

Clinical conferences and graduate assemblies of less than five days were held in twelve states. Many of these opportunities scheduled for the first six months of 1945 were canceled at the request of the Office of War Mobilization. The twelve states in which such studies were presented were Connecticut, Illinois (4), Michigan, Missouri (3), Nebraska, New York, North Carolina, Ohio, Pennsylvania, Texas (2), Virginia and West Virginia. The specialties covered were allergy, anesthesiology, dermatology and syphilology, industrial medicine, general medicine, neurology and psychiatry, neurosurgery, obstetrics and gynecology, ophthalmology and otolaryngology, pediatrics, physical therapy, radiology and tuberculosis. Twenty agencies participated in the instruction. The assemblies were held in centers with facilities for clinical and practical work and for

scientific exhibits. Instruction was both didactic and clinical. The facilities of hospitals, clinics and medical schools were used. The instructors included physicians residing in the state where the assembly was held, physicians from other states and members of the professorial faculties of medical schools. One or more assemblies were held in each month from September to April inclusive. Registration fees ranged from $2 to $15, while no fee was charged in two instances and four were free to medical officers. The total recorded attendance was 6,847. The total recorded attendance for all courses in 1944 was 19,045.

The travel restrictions have affected considerably the latter group as well as opportunities of an itinerant nature. The organized courses have been affected to a lesser extent. It is to be hoped that physicians may be able to avail themselves of a variety of courses scheduled for the future. The attendance for most of these courses is limited in number and is not affected by the edict of the transportation authorities.

For all three types of training offered during 1944-1945 the attendance was 18,206. This figure excludes physicians who were enrolled for courses of longer than a year's duration as well as those serving internships and residencies and physicians who attended the Wartime Graduate Medical Meetings, and courses arranged by the military authorities for medical officers.

WARTIME GRADUATE MEDICAL MEETINGS

Under the auspices of a committee representing the American Medical Association, the American College of Physicians and the American College of Surgeons a series of wartime graduate medical meetings have been held for the past several years. The administrative work is done entirely by a central committee with headquarters at the office of the American College of Physicians. Locally the programs have been arranged for and conducted under the supervision of regional chairmen and local committees. The central committee and regional chairmen have been emphasizing programs available to the men in military service rather than programs for the civilian physician. The major purpose of these activities is to maintain contact with civilian medicine. The central committee has initiated a program whereby a team of physicians covers a circuit of more or less isolated military installations in order to meet the needs that could not be met otherwise. The activities of these Wartime Graduate Medical Meetings continue, although it is probable that they will terminate at the conclusion of hostilities or as soon thereafter as demobilization takes place.

Programs, often more than one, were arranged in every state during the past year. These programs were arranged in one or more Army or Navy installations within a state and varied from a single lecture to a series of talks in a given center. The attendance at these sessions has not been reported routinely, but reports made by the Central Committee to the Committee on Postwar Medical Service gives evidence of the continued usefulness of these meetings.

POSTWAR EDUCATIONAL PLANS OF STATE MEDICAL SOCIETIES

Fourteen state medical societies have initiated or are planning programs of continuation education for physicians returning from military service. Some of these plans are in the formative stage, while a few states have developed extensive programs. Other states have reported that they are not planning statewide programs of graduate education but have the assurance of the medical schools of the state that veteran physicians will be provided the type of graduate training they may desire. In some of the smaller states the personnel is not available to develop such opportunities.

The progress to date in the fourteen states referred to briefly is as follows:

The California Medical Association has appointed a Committee on Postwar Plans and has inaugurated studies of hospital internships and residencies as an initial stage of their responsibility and the foundation for the development of educational programs for returning physicians.

In Connecticut the Committee on Medical Care and Health of the State Postwar Planning Board designated a Subcommittee on Intern Curriculum to study intern service and intern training in Connecticut hospitals. This subcommittee brought out a report in November 1944 and included recommendations intended to serve as a guide to hospitals in improving the quality of internships available.

In Indiana postwar educational work is being done through the Indiana University School of Medicine. At the request of the Tippecanoe County Medical Society the university is conducting an extension course in postgraduate medical instruction at St. Elizabeth's Hospital, Lafayette, referred to as the "Lafayette Experiment." In this venture the physicians of Tippecanoe County are cooperating.

The Kansas Medical Society is attempting to raise through voluntary contributions a fund of $100,000 to be used at the direction of its Committee on Graduate Education for the postwar training of Kansas doctors who are returning from the armed forces and for the establishment of programs of postgraduate instruction for the use of all members of the society. Various types of courses will be offered by the University of Kansas School of Medicine. The society in cooperation with the State Board of Health and the Kansas Hospital Association plan a comprehensive statewide study of hospitals. Plans are also under way to subsidize a program of postgraduate courses to be offered on the circuit plan in forty-five to fifty different centers in the state.

Extension courses are under way by the Kentucky State Medical Association which provide for lectures to physicians at various places on the plan of one day per week for four weeks. The cost of these courses will be borne by the state society which consists of travel expenses of lecturers.

The Committee on Postwar Planning in Massachusetts is ready to aid hospitals of the state in developing their organizations to provide approved residencies by visiting and consulting with hospital trustees and staff members. The society also plans to expand the circuit plan of graduate education which has been in operation in that state.

The 1944 Michigan State Medical Society House of Delegates created a Medical Veterans' Readjustment Program, financed by a five dollar special assessment per capita. In a few cases special and rather complicated postgraduate programs have been developed through the Office of Veterans' Affairs and the University of Michigan Department of Postgraduate Medicine.

In Missouri the Committee on Postwar Planning has prepared a preliminary report and a plea for cooperation in the plans of the national organizations which are assuming a major responsibility on a nationwide scale.

The educational program of the Medical Society of the State of New York provides for instruction consisting of single lectures, series of lectures and teaching days throughout the state in cooperation with the county medical society.

The Oklahoma State Medical Association and the State Board of Health, with funds contributed by these agencies as well as the Commonwealth Fund and the United States Public Health Service, offer a course consisting of one night a week for ten weeks in various centers throughout the state.

The Committee on Postwar Planning of the South Carolina Medical Association is preparing a program to mobilize both the medical and hospital facilities of the state in a program of education.

The Medical Society of Virginia is developing plans in order to be able to provide returning physicians with information as to where they can receive further training either of general or of specialized nature.

Tennessee has a Postwar Planning Committee which is cooperating with other agencies and institutions in the state.

The general plans of the Washington State Medical Association provide for the establishment of short clinical and some didactic courses in the various specialties. These courses will be offered primarily at King County Hospital, Seattle.

EXAMINING BOARDS IN THE MEDICAL SPECIALTIES

Fifteen examining boards leading to specialty certification have been organized, and all of these boards have been in operation since 1940. In 1933 the Council on Medical Education and Hospitals was instructed by the House of Delegates of the American Medical Association to formulate minimal standards deemed essential for certification as a specialist. At that time there were five examining boards in the medical specialties functioning: pediatrics, dermatology and syphilology, obstetrics and gynecology, ophthalmology and otolaryngology. The fifteen boards now operating are fully approved by the Council.

Two boards certify candidates in subspecialties. The American Board of Internal Medicine certifies in allergy, cardiovascular disease, gastroenterology and tuberculosis. Similarly the American Board of Surgery certifies specialists in proctology. Regular board certification is a prerequisite for certification in the subspecialty. This function of the boards in internal medicine and surgery is also approved by the Council.

The "Essentials of Approved Examining Boards in Medical Specialties," as prepared by the Council, outlines the type of organization and the responsibilities of such boards as well as the minimum qualifications deemed necessary for certification as a specialist. Such qualifications include graduation from an approved medical school, completion of an internship in a hospital approved by the Council, and a period of specialized training in a selected specialty. Three years of special training and a further period of two years devoted to specialty study and/or practice is considered by the Council to be the minimal training required before specialty practice. Some boards require more than this amount of training and education. Each board publishes a booklet containing information regarding its organization, personnel, purposes and requirements for certification. A statement of these requirements for each board was given in detail in the Educational Number of THE JOURNAL in 1942.[1] Only a few minor changes have been made by some of the boards since these regulations were published in 1942.

The Advisory Board for Medical Specialties was organized in 1933-1934 to coordinate graduate education and certification of medical specialists in the United States and Canada. This board reports directly to the member groups and functions in close collaboration with the Council on Medical Education and Hospitals of the American Medical Association.

The majority of the boards grant some credit for military service. The policies adopted by the boards vary. One board grants an indefinite amount of credit, to be determined by an evaluation of the experience of individual applicants. Another grants full credit for work done in the surgical division of a regularly constituted army or navy hospital. Most boards limit the credit allowed to one year of training and/or one year of experience. The special provisions for military credit made by each board were published in the 1943 Educational Number of THE JOURNAL.[2]

Prospective applicants who are in military services should obtain the booklet entitled "Record of Professional Assignments for Prospective Applicants for Certification by Specialty Boards" from the secretary of the board in the specialty desired. This booklet describes procedures pertaining to military credit and will enable the candidate to keep an accurate account of work done in military service duly certified and will constitute part of the credentials to be submitted on application for certification. The American Board of Internal Medicine has conducted special examinations for certification in Europe. All boards schedule examinations in various cities throughout the country throughout the year for the convenience of civilian physicians seeking certification as well as those in military service. THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION announces specialty board schedules on alternate weeks under the heading "Medical Examinations."

TABLE 24.—*Annual Specialty Board Certifications Since 1940*

Year (Ended March)	Number of Boards in Existence	Number Certified That Year	Accumulated Totals
1940	14	.....	15,853
1941	15	2,085	17,938
1942	15	1,756	19,694
1943	15	2,172	21,866
1944	15	1,578	23,444
1945	15	1,308	24,752

The 9-9-9 graduate program curtails the number of physicians desiring specialty certification. Under this wartime program the various boards are taking this into consideration and will probably allow credit for the actual time spent by the candidate in house officer training in approved hospitals.

The Council on Medical Education and Hospitals cooperates with the various specialty boards in the

1. J. A. M. A. **119**: 1345 (Aug. 15) 1942.

2. J. A. M. A. **122**: 1085 (Aug. 14) 1943.

approval of residencies and fellowships acceptable for certification. The Council inspects and evaluates new residencies in most instances; it approves residency programs jointly with the specialty boards. This program has been established so that approved services may be equally acceptable to the Council and to the respective specialty boards.

An analysis of questionnaires returned by 21,029 medical officers pertaining to their future educational plans [3] indicates that over 12,000 medical officers will seek specialty certification after the war. The Council, working with specialty boards, hospitals, medical schools and the Committee on Postwar Medical Service, has made notable progress in meeting these educational needs of the future in the advanced training of specialists, particularly physician veterans (see discussion, pp. 55 to 57).

Table 24 gives the annual number of specialists certified by all boards for the past five years. The largest number (2,172) obtained certificates in the year ended March 1943. In the two succeeding years there were progressive decreases primarily because of the war. Of all those physicians now certified, 37 per cent received their specialty credentials in the past five years.

A list of the specialty boards and their officers and the number of certificates awarded prior to March 30, 1944 and the number certified until March 1, 1945 respectively appear in table 25. On March 30, 1944 there were 23,444 physicians certified by the fifteen boards, and in the following year 1,308 were certified. Up to March 1, 1945 a total of 24,752 certificates had been issued. Included in these figures are 764 who had been certified in the subspecialties, namely allergy 75, cardiovascular disease 325, gastroenterology 157, proctology 71 and tuberculosis 136.

In the major specialties of general medicine and general surgery, 3,541 and 2,499 respectively have received the certificate of these boards. However, the greatest number in any one specialty certified was in otolaryngology. In this specialty 3,848 have received the board's certificate since its organization in 1924. The board in ophthalmology, organized in 1917 and the oldest board in existence, has to date certified 2,437 individuals.

A key number has been assigned to each approved board, such as A.B. 1, and the biographic records of physicians published in the American Medical Directory includes by this method reference to those certified by the boards.

The Council on Medical Education and Hospitals and representatives of the various boards and the Advisory Board for Medical Specialties annually hold a joint session for the interchange of ideas and the discussion of problems of mutual interest. These meetings have proved to be worthwhile contributions to the improvement of medical education and medical practice in this country.

TABLE 25.—*Approved Examining Boards in Medical Specialties*

Key No.	Name of Board	Year of Incorporation	Total Certificates Awarded to March 30, 1944	Total Certificates Awarded to March 1, 1945
A.B. 1.	American Board of Pediatrics..... Pres., Edward B. Shaw, 384 Post St., San Francisco Sec., C. A. Aldrich, 115½ First Ave. S. W., Rochester, Minn.	1933	2,220	2,318
A.B. 2.	American Board of Psychiatry and Neurology ..... Pres., Hans A. Reese, Wisconsin Psychiatric Institute, Madison Sec., Walter Freeman, 1028 Connecticut Ave. N. W., Washington, D. C.	1934	1,716	1,899
A.B. 3.	American Board of Orthopaedic Surgery ..... Pres., Frank D. Dickson, 1400 Professional Bldg., Kansas City, Mo. Sec., Guy A. Caldwell, 3503 Prytania St., New Orleans	1934	860	896
A.B. 4.	American Board of Dermatology and Syphilology ..... Pres., Howard Fox, 140 E. 54th St., New York City Sec., George M. Lewis, 66 E. 66th St., New York City	1932	680	710
A.B. 5.	American Board of Radiology..... Pres., John W. Pierson, 1107 St. Paul St., Baltimore Sec., Byrl R. Kirklin, 102-110 Second Ave., S. W., Rochester, Minn.	1934	2,012	2,095
A.B. 6.	American Board of Urology..... Pres., Herman L. Kretschmer, 122 S. Michigan Ave., Chicago Sec., Gilbert J. Thomas, 1409 Willow St., Minneapolis	1935	983	1,018
A.B. 7.	American Board of Obstetrics and Gynecology ..... Pres., W. T. Dannreuther, 580 Park Ave., New York City Sec., Paul Titus, 1015 Highland Bldg., Pittsburgh	1930	1,764	1,871
A.B. 8.	American Board of Internal Medicine ..... Chairman, Reginald Fitz, 319 Longwood Ave., Boston Asst. Sec., W. A. Werrell, 1301 University Ave., Madison, Wis.	1936	3,263	3,541
A.B. 9.	American Board of Pathology..... Pres., Arthur H. Sanford, 102 Second Ave., S. W., Rochester, Minn. Sec., F. W. Hartman, Henry Ford Hospital, Detroit	1936	984	1,047
A.B. 10.	American Board of Ophthalmology Chairman, John Green, 3720 Washington Blvd., St. Louis Sec., S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.	1917	2,336	2,437
A.B. 11.	American Board of Otolaryngology Pres., Harris P. Mosher, 127 Front St., Marblehead, Mass. Sec., Dean M. Lierle, University Hospital, Iowa City	1924	3,737	3,848
A.B. 12.	American Board of Surgery..... Chairman, Arthur W. Elting, 119 Washington Ave., Albany, N. Y. Sec., J. S. Rodman, 225 S. 15th St., Philadelphia	1937	2,349	2,499
A.B. 13.	American Board of Anesthesiology Pres., H. Boyd Stewart, 27th Place Tulsa, Okla. Sec., Paul M. Wood, 745 Fifth Ave., New York City	1938	231	249
A.B. 14.	American Board of Plastic Surgery ..... Chairman, John S. Davis, 701 Cathedral St., Baltimore Sec., James B. Brown, 508 N. Grand Blvd., St. Louis	1937	160	161
A.B. 15.	American Board of Neurological Surgery ..... Chairman, Howard C. Naffziger, 384 Post St., San Francisco Sec., Paul C. Bucy, 912 S. Wood St., Chicago	1940	149	163
	Advisory Board for Medical Specialties Pres., Paul Titus, 1015 Highland Bldg., Pittsburgh Sec., Byrl R. Kirklin, 102-110 Second Ave., S. W. Rochester, Minn.			
	Totals.....		23,444	24,752

Certification in the subspecialties: By the American Board of Internal Medicine: allergy 75, cardiovascular disease 325, gastroenterology 157, tuberculosis 136, total 693. By the American Board of Surgery: proctology 71. Total certified in the subspecialties, 764. These figures are included in the above tabulation.

3. J. A. M. A. **127**: 759 (March 31) 1945.

APPROVED MEDICAL SCHOOLS

ARKANSAS

Little Rock

UNIVERSITY OF ARKANSAS SCHOOL OF MEDICINE, 1209 McAlmont Street.—Organized is 1879 as the Medical Department of Arkansas Industrial University. Present title in 1899. In 1911 the College of Physicians and Surgeons united with it and it became an integral part of the University of Arkansas. The first class was graduated in 1880. Clinical teaching was suspended in 1918 but resumed in 1923. Coeducational since organization. The faculty consists of 33 professors and 117 lecturers and instructors, a total of 150. The curriculum covers four sessions of nine months each. Entrance requirements are two years of collegiate work. The B.S. degree is conferred at the end of the second year. An accelerated program was adopted July 1, 1943, involving the admittance and graduation of a class approximately every nine months. The fees for the four years for residents of Arkansas are $280 per year; nonresidents are charged $225 additional each year. The registration for the present session is 266. The session began January 2 and will end September 21. The next session will begin October 1. The Dean is Byron L. Robinson, M.D.

CALIFORNIA

Berkeley-San Francisco

UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL, University Campus, Berkeley; Medical Center, San Francisco, Zone 22.—Organized in 1864 as the Toland Medical College. The first class graduated in 1864. In 1873 it became the Medical Department of the University of California. In 1909, by legislative enactment, the College of Medicine of the University of Southern California, at Los Angeles, became a clinical department but was changed to a graduate school in 1914. In 1915 the Hahnemann Medical College of the Pacific was merged, and elective chairs in homeopathic materia medica, and therapeutics were provided. Coeducational since organization. Three years of collegiate work are required for admission. The work of the first year is given at Berkeley and that of the last three years at San Francisco. An accelerated program has been adopted consisting of three terms of sixteen weeks in each academic year. The medical course may now be completed in three years. The faculty is composed of 190 professors and 335 associates and assistants, a total of 525. The fees average $162 per academic year, nonresidents are charged $125 additional each year. The registration for the present session is 296. The session for the freshmen, sophomores and juniors began March 1 and will end October 20. The senior class began March 1, 1945 and will end Feb. 23, 1946. The next freshman class will begin October 29. The Dean is Francis Scott Smyth, M.D., San Francisco.

Loma Linda-Los Angeles

COLLEGE OF MEDICAL EVANGELISTS, Loma Linda; Boyle and Michigan Avenues, Los Angeles, Zone 23.—Organized in 1909. The first class graduated in 1914. The laboratory departments are at Loma Linda; the clinical departments at Los Angeles. Coeducational since organization. Three years of collegiate work are required for admission. The faculty is composed of 43 professors and 357 associate professors, assistant professors, instructors and assistants—making a total of 400. The course covers a period of three years of four nine-month academic sessions and an additional twelve-month (nine-month for military personnel) internship in an approved hospital. The total fees are respectively, $602, $590, $612 and $620. The registration for 1944-1945 is 371; graduates 73. The present session for the freshman and sophomore students began on Dec. 31, 1944 and will end Sept. 18 and Sept. 25, 1945, respectively. The present session for the junior students began Jan. 7, 1945, and will end on Sept. 21, 1945. The last session for the senior students began on Oct. 1, 1944, and ended on July 1, 1945. The next freshman class will begin on Oct. 5, 1945. The President is Walter E. Macpherson, M.D., Los Angeles. The Dean is Newton G. Evans, M.D., Loma Linda. The Associate Dean is W. F. Norwood, Ph.D., Los Angeles.

Los Angeles

UNIVERSITY OF SOUTHERN CALIFORNIA SCHOOL OF MEDICINE, 3551 University Avenue, Zone 7.—Organized in 1895 as the University of Southern California College of Medicine. First class graduated in 1888. In 1908 it became the Los Angeles Medical Department of the University of California. In 1909 the College of Physicians and Surgeons, established in 1904, became the Medical Department of the University of Southern California. Its activities were suspended in 1920; reorganized in May 1928, under present title. Entrance requirements are approximately 90 semester hours. During present national emergency will operate the year round on accelerated three term basis, each term continuing for sixteen weeks. The faculty consists of 189 professors, associate professors and assistant professors and 241 instructors, assistants and lecturers—a total of 430, 147 of whom are now on active duty with the armed forces. An internship is required for graduation. Coeducational since organization. Annual fees (1½ academic years) amount to $852. The registration for 1944-1945 was 254; graduates 54. The last session for freshmen, sophomores and juniors began Oct. 30, 1944 and ended July 27, 1945. Seniors began their course Oct. 16, 1944 and completed the course June 23. The next freshman class will begin Aug. 6, 1945. The Dean is Burrell O. Raulston, M.D.

Stanford University-San Francisco

STANFORD UNIVERSITY SCHOOL OF MEDICINE, University Campus, Stanford University; 2398 Sacramento Street, San Francisco. The main buildings are in San Francisco. The laboratories of anatomy, bacteriology and experimental pathology, chemistry, and physiology are located on the campus at Stanford University, which is thirty miles southeast of San Francisco adjoining the City of Palo Alto. The post office is Stanford University. Organized in 1908, when by agreement the interests of Cooper Medical College were taken over. The first class graduated in 1913. Coeducational since organization. The faculty consists of 138 professors and 190 lecturers, assistants and others, a total of 328. Two years of collegiate work are required for admission. The quarter plan is in operation. An internship is a requirement for graduation. The fees for the four years, respectively, are $474, $438, $414 and $414. The registration for 1944-1945 was 240; graduates 59. The present session for freshmen, sophomores and juniors began Jan. 8, 1945 and will end Sept. 29, 1945; for seniors Oct. 9, 1944 to June 23, 1945. The next freshman class will be enrolled Oct. 8, 1945. The Dean is Loren Roscoe Chandler, M.D.

COLORADO

Denver

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE, 4200 East Ninth Avenue.—Organized in 1883. Classes were graduated in 1885 and in all subsequent years except 1898 and 1899. Denver and Gross College of Medicine was merged Jan. 1, 1911. Coeducational since organization. The faculty is composed of 57 professors and 130 lecturers, instructors and assistants, a total of 187. The accelerated program has been adopted. The entrance requirements for nonmilitary students are three years of collegiate work. The fees average $100 per academic year. Nonresidents are charged $82 additional each year. The registration for 1944-1945 was 237; graduates 55. The last session began Oct. 2, 1944 and ended June 26, 1945. The present freshman class enrolled July 2, 1945. The Acting Dean is Ward Darley, M.D.

CONNECTICUT

New Haven

YALE UNIVERSITY SCHOOL OF MEDICINE, 333 Cedar Street.—Chartered in 1810 as the Medical Institution of Yale College. Organized in 1812; instruction began in 1813; first class graduated in 1814. A new charter in 1879 changed the name to the Medical Department of Yale College. In 1884, the Connecticut Medical Society surrendered such authority as had been granted by the first charter. In 1887, Yale College became Yale University. Coeducational since 1916. The faculty consists of 197 professors and 197 lecturers and assistants, a total of 394. Of this number, 29 are on leave of absence for war service and about 150 others have entered the armed forces upon completion of or during appointments. The requirements for admission are three years of collegiate work. An accelerated program has been adopted. The fees average $506 per academic year. The registration for 1944-1945 was 250; graduates 61. The last session began Sept. 25, 1944 and ended June 16, 1945. The next freshman session will commence September 24. The Dean is Francis G. Blake, M.D.

DISTRICT OF COLUMBIA

Washington

GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE, 3900 Reservoir Road, N.W.—Organized in 1851. First class graduated in 1852. The faculty is composed of 50 professors, 49 associate professors, 22 assistant professors, 17 adjunct professors and 155 instructors, a total of 293, of whom 71 are on military leave. The complete premedical Army Specialized Training Program or Navy College Training Program satisfied the minimum prerequisites for military or naval trainees. Civilian students must finish at least three academic years of premedical work in an approved college of

arts and sciences. The accelerated program will be continued only as long as the Army and Navy programs remain in force. The fees average $520 per academic year. Registration for 1944-1945 was 367, graduates 87. The current session for upper classmen began July 9, 1945. The next session for first year students will begin Sept. 10, 1945. The Dean is David V. McCauley, S.J., Ph.D.

George Washington University School of Medicine, 1335 H Street, N.W.—Organized in 1825 as the Medical Department of Columbian College. Also authorized to use the name National Medical College. Classes were graduated in 1826 and in all subsequent years except in 1834 to 1838, and 1861 to 1863, inclusive. The original title was changed to Medical Department of Columbian University in 1873. In 1903 it absorbed the National University Medical Department. In 1904, by an Act of Congress, the title of George Washington University was granted to the institution. Coeducational since 1884. The faculty is composed of 81 professors and 150 instructors, demonstrators and assistants, a total of 231. Sixty semester hours of collegiate work are required for admission. An accelerated program has been adopted. The fees average $550 per academic year. The registration for 1944-1945 was 316; graduates, 73. The last session began Sept. 18, 1944 and ended in June 1945. The subsequent session for freshmen will begin Sept. 17, 1945 and end June 15, 1946; for other classes June 18, 1945 to March 9, 1946. The Dean is Walter A. Bloedorn, M.D.

Howard University College of Medicine, Fifth and W. Streets, N.W.—Chartered in 1867. Organized in 1869. The first class graduated in 1871. Coeducational since organization. Negro students compose a majority of those in attendance. The faculty comprises 38 professors and 73 instructors and assistants, a total of 111. The admission requirements are at least two years of collegiate work. The course covers four years of thirty-three weeks each. An accelerated program has been adopted. The fees are, respectively, $334, $334, $324 and $331. The registration for 1944-1945 is 273. The present class began Dec. 28, 1944 and will end Sept. 7, 1945. The next session will begin Sept. 29, 1945 and end June 7, 1946. The Dean is John W. Lawlah, M.D.

GEORGIA

Atlanta

Emory University School of Medicine, 50 Armstrong Street, Zone 3.—Organized in 1854 as the Atlanta Medical College. Classes graduated 1855 to 1861, when it suspended. Reorganized in 1865. A class graduated in 1865 and each subsequent year except 1874. In 1898 it merged with the Southern Medical College (organized in 1878), taking the name of Atlanta College of Physicians and Surgeons. In 1913 it merged with Atlanta School of Medicine (organized in 1905), reassuming the name of Atlanta Medical College. Became the Medical Department of Emory University in 1915; assumed present title in 1917. For civilian students three years of collegiate work are required for admission. Students in the armed services are admitted in accordance with regulations set up by them. The course of study is four academic years of thirty-two weeks each. An accelerated program has been adopted. The fees for each of the four academic years are $500. The registration for 1944-1945 was 248; graduates, 56. The last session began Oct. 2, 1944 and ended in June 1945. The next session for freshman will begin Sept. 24 and end June 15, 1946; for other classes sessions begin July 2 and will end March 19, 1946. The Acting Dean is Eugene A. Stead, Jr., M.D.

Augusta

University of Georgia School of Medicine, University Place.—Organized in 1828 as the Medical Academy of Georgia, the name being changed to the Medical College of Georgia in 1829. After 1873 it was known as the Medical Department of the University of Georgia. On July 1, 1933, the name was changed to the University of Georgia School of Medicine. Property transferred to the University in 1911. Classes were graduated in 1833 and all subsequent years except 1862 and 1863. Coeducation was begun in 1920. The faculty includes 30 professors and 65 associate and assistant professors, instructors, lecturers and assistants, a total of 95. Of this number 21 are on military leave. Three years of collegiate work are required for admission (except for the duration of the present war the minimum requirement will be two years for Army and Navy students). An accelerated program has been adopted. The fees average $225 per academic year for residents of Georgia; nonresidents $445. The registration for the 1944-1945 session was 285; graduates 64. The last session began Sept. 27, 1944 and ended June 11, 1945. The present session for the upper classes began July 6, 1945; the first year class will begin on Sept. 27, 1945. The Dean is G. Lombard Kelly, M.D.

ILLINOIS

Chicago

Loyola University School of Medicine, 706 South Wolcott Avenue.—Organized in 1915 by acquisition of Bennett Medical College, which had been organized in 1869. Facilities enlarged upon by acquisition of Chicago College of Medicine and Surgery, faculties in basic medical sciences put on full time basis and present title assumed in 1917. Operated as an organic part of Loyola University. Coeducational since organization. The faculty is composed of 19 full time professors and 329 associate and assistant professors, associates, instructors and assistants, a total of 348. Sixty semester hours of collegiate work are required for admission. The fees average $515 per academic year. The registration for 1944-1945 was 313, graduates 80. The last session began on Oct. 2, 1944 and ended June 23, 1945. The subsequent session began July 5, 1945 for sophomores, juniors and seniors, and will begin on Oct. 1, 1945 for freshmen. The Dean is Italo F. Volini, M.D.

Northwestern University Medical School, 303 East Chicago Avenue.—Organized in 1859 as the Medical Department of Lind University. First class graduated in 1860. In 1864 it became independent as the Chicago Medical College. It united with Northwestern University in 1869 but retained the name of Chicago Medical College until 1891, when the present title was taken. Became an integral part of Northwestern University in 1905. Coeducational since 1926. The faculty comprises 27 professors, 147 associate and assistant professors and 446 associates, instructors and clinical assistants, a total of 620. For the duration of the war the requirement for admission is two years of collegiate work. The B.S. in medicine degree may be conferred before the end of the senior year. An accelerated program has been adopted. A hospital internship is required for graduation. The total fees are $500 each year. The registration for 1944-1945 was 584; graduates 165. The last session began Sept. 27, 1944 and ended June 9, 1945. The present session began on June 27, 1945 for sophomores, juniors and seniors; and will begin on Oct. 1, 1945 for freshmen. The Dean is J. Roscoe Miller, M.D.

University of Chicago, The School of Medicine, Fifty-Eighth Street and Ellis Avenue.—Organized in 1924, as a part of the Ogden Graduate School of Science of the University of Chicago. In 1932, when the University of Chicago reorganized its departments, the medical departments were included in the Biological Sciences Division. The work of the first two years in the medical courses has been given on the University Quadrangles since 1899; but the last two years were offered only at Rush Medical College which was affiliated with the university until 1927 when actual work in the clinical departments on the campus began. After that time, candidates for the degree of Doctor of Medicine could take the work of the first two years on the campus and the work of the third and fourth years either on the campus or at the Rush Medical College. In June 1940 Rush Medical College became affiliated with the University of Illinois College of Medicine. All undergraduate instruction is now given only on the campus of the University of Chicago. The faculty of the School of Medicine is composed of 90 professors, 125 associates, instructors and others, a total of 215. The requirements for admission are 90 semester hours of collegiate work or completion of the Army or Navy premedical program. The B.S. degree may be obtained during the second year. The curriculum covers twelve quarters of work. Sixty-five students are admitted to the first year class each year. The tuition fee averages $555. The registration for 1944-1945 was 252; graduates 62. Quarters begin in March, June, September and December of each year. All correspondence relating to general policies should be addressed to A. C. Bachmeyer, M.D., Associate Dean of the Biology Division, and that pertaining to student affairs to F. J. Mullin, Ph.D., Assistant Dean of Students.

University of Illinois College of Medicine, 1853 West Polk Street, Zone 12.—Organized in 1882 as the College of Physicians and Surgeons. The first class graduated in 1883. It became the Medical Department of the University of Illinois by affiliation in 1897. Relationship with the university was canceled in June 1912, and was restored in March 1913, when the present title was assumed. The staff of the Rush Medical College was incorporated in the University of Illinois College of Medicine in 1942 and at the same time Presbyterian Hospital, Chicago, became a teaching unit of the university. Coeducational since 1898. Two years of collegiate work are required for admission. An accelerated program has been adopted. The B.S. in medicine degree is conferred at the end of the second year. The faculty is composed of 250 professors and 250 associates, instructors and assistants, a total of 500. The fees for residents of Illinois average $288 per academic year; nonresidents pay an addition fee of $150. The registration for the present session is 665. The session began January 2 and will end September 14. The subsequent session will begin October 1, and end June 21, 1946. The Dean is Raymond B. Allen, M.D.

INDIANA

Bloomington-Indianapolis

Indiana University School of Medicine, Bloomington; 1040 West Michigan Street, Indianapolis.—Organized in 1903 but did not give all the work of the first two years of the medical course until 1905. In 1907, by union with the State College of Physicians and Surgeons, the complete course in medicine was offered. In 1908 the Indiana Medical College, which was formed in 1905 by the merger of the Medical College of Indiana (organized in 1878), the Central College of Physicians and Surgeons (organized in 1879), and the Fort Wayne College of Medicine (organized in 1879) merged into it. The first class was graduated in 1908. Coeducational since organization. The B.S. degree in anatomy and physiology is conferred. The school has been on an all-time program since May 11, 1942. Three years of college work are required in normal times for admission, but during the national emergency the application from any student who has had two years of college will be accepted if his work is of a high standard. Each calendar year is divided into three semesters. The work given in two semesters is equivalent to the work formerly given in a year. The work of the first two semesters is given

at Bloomington; the remainder of the work at Indianapolis. Regular fee for two semesters of work is $217 for residents of Indiana and $422 for nonresidents. The registration for the last session was 397. The session began Dec. 28, 1944 and ended Aug. 18, 1945. The subsequent session will begin September 3 and will end April 23, 1946. The Dean is Willis D. Gatch, M.D., Indianapolis.

IOWA

Iowa City

STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE, University Campus.—Organized in 1869. First session began in 1870. First class graduated in 1871. Absorbed Drake University College of Medicine in 1913. Coeducational since 1870. The faculty is made up of 56 professors, 74 lecturers, demonstrators and assistants, a total of 130. Three years of collegiate work are required for admission. The B.A. degree in the combined course of liberal arts and medicine is conferred. An accelerated program has been adopted. The tuition fee is $226 each year for residents of Iowa and $490 for nonresidents. The registration for 1944-1945 was 307; graduates 81. The last session began on Oct. 2, 1944 and ended June 16, 1945. The present session began on July 2, 1945 for sophomores, juniors and seniors; and will begin on Sept. 24, 1945 for freshmen. The Dean is Ewen Murchison MacEwen, M.D.

KANSAS

Lawrence-Kansas City

UNIVERSITY OF KANSAS SCHOOL OF MEDICINE, Lawrence; 39th Street and Rainbow Boulevard, Kansas City.—Organized in 1880. It offered only the first two years of the medical course until 1905, when it merged with the Kansas City (Mo.) Medical College, founded in 1869, the College of Physicians and Surgeons, founded in 1894, and the Medico-Chirurgical College, founded in 1897. Absorbed Kansas Medical College in 1913. The first class graduated in 1906. The clinical courses are given at Kansas City. Coeducational since 1880. The faculty includes 64 professors and 125 instructors, assistants and others, a total of 189. The requirement for admission is three years of collegiate work. Students must have collegiate degree to enter sophomore year. The B.S. degree in medicine is conferred at the end of the second year. An accelerated program has been adopted. The annual fees for residents of the state average $218; nonresidents $290. The registration for 1944-1945 was 302; graduates 80. The last session began on Oct. 30, 1944 and ended June 26, 1945. The subsequent session began on July 2, 1945 for sophomores, juniors and seniors; and will begin on Sept. 17, 1945 for freshmen. The Dean is Harry R. Wahl, M.D., Kansas City.

KENTUCKY

Louisville

UNIVERSITY OF LOUISVILLE SCHOOL OF MEDICINE, 101 West Chestnut Street, Zone 2.—Organized in 1837 as Louisville Medical Institute. The first class graduated in 1838, and a class graduated each subsequent year except 1863. In 1846 the name was changed to University of Louisville Medical Department. In 1907 it absorbed the Kentucky University Medical Department; in 1908, the Louisville Medical College, the Hospital College of Medicine and the Kentucky School of Medicine. In 1922 it changed its name to the University of Louisville School of Medicine. Coeducational since organization. Two years of collegiate work are the minimum requirements for admission. Preference is given applicants with a degree or three college years leading to a degree. The faculty numbers 68 professors and 70 assistants, instructors and others, a total of 138. An accelerated program has been adopted. Fees are $450 for residents of Louisville and Jefferson County and $550 for nonresidents, per school year. The registration for 1944-1945 was 365; graduates 87. The last session began on Sept. 27, 1944 and ended June 15, 1945. The subsequent session began July 11, 1945 and will end March 23, 1946. The Dean is John Walker Moore, M.D.

LOUISIANA

New Orleans

LOUISIANA STATE UNIVERSITY SCHOOL OF MEDICINE, 1542 Tulane Avenue, Zone 13.—Organized January 1931 as Louisiana State University Medical Center. Present title in 1939. Coeducational. First session October 1931, with students of first and third year. Faculty comprises 26 professors and 72 associate professors, assistant professors, instructors and assistants, a total of 98. Course covers four sessions of not less than 32 weeks each. Under the accelerated program adopted for the duration of the war, a first year class will be admitted each year and the entire course will be completed within a period of three years from the date of admission. A minimum of three years collegiate work is required for admission. Total fees, $134 each year for residents of Louisiana; additional tuition of $400 each year for nonresidents. The registration for 1944-1945 was 325, graduates 80. The last session began Sept. 27, 1944 and ended June 9, 1945. The present session began June 28, 1945 for second, third and fourth year students, and will begin Sept. 13, 1945 for first year students. It will end March 9, 1946 for the first group and May 25, 1946 for freshmen. The subsequent session will begin in April 1946 for third and fourth year students, June for second year students and September for first year students. The Dean is Wilbur C. Smith, M.D.

TULANE UNIVERSITY OF LOUISIANA SCHOOL OF MEDICINE, 1430 Tulane Avenue.—Organized in 1834 as the Medical College of Louisiana. Classes were graduated in 1835 and in all subsequent years except 1863-1865, inclusive. It became the Medical Department of the Tulane University of Louisiana in 1884. Present title in 1913. Coeducational since 1915. The faculty comprises 34 professors and 240 associate and assistant professors, instructors and assistants, a total of 274. An accelerated program has been adopted. A minimum of three years of collegiate work is required for admission. Total fees average $547 per academic year. The registration for the last session was 514. The session began on Dec. 1, 1944 and ended Aug. 14, 1945. The next session will begin Sept. 1, 1945 and will end May 15, 1946. The Dean is Hiram W. Kostmayer, M.D.

MARYLAND

Baltimore

JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE, 710 North Washington Street.—The nucleus of a Medical Faculty was constituted in 1883. Systematic postgraduate instruction in pathology and bacteriology was begun in 1886. School was fully organized and opened in 1893. The first class graduated in 1897. Coeducational since organization. The faculty consists of 71 professors and 403 instructors, assistants and others, a total of 474. The requirement for admission is temporarily two college years. An accelerated program has been adopted. The fees average $627 per academic year. The registration for 1944-1945 was 309; graduates 81. The last session began on Sept. 25, 1944 and ended June 7, 1945. The subsequent session began June 8, 1945 for sophomores, juniors and seniors, and will begin Sept. 10, 1945 for freshmen. The Dean is Alan M. Chesney, M.D.

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE AND COLLEGE OF PHYSICIANS AND SURGEONS, Lombard and Greene Streets, Zone 1.—Organized in 1807 as the College of Medicine of Maryland. The first class graduated in 1810. In 1812 it became the University of Maryland School of Medicine. Baltimore Medical College was merged with it in 1913. In 1915 the College of Physicians and Surgeons of Baltimore was merged and the present name assumed. Coeducational since 1918. The faculty consists of 52 professors and 332 associate and assistant professors and others, a total of 384, of which 137 are now absent serving with the Armed Forces. Premedical college training reduced from three to two years for the duration of the war. An accelerated program has been adopted. The tuition fees average $508 for residents of the state; for nonresidents approximately $150 additional. The registration for 1944-1945 was 375; graduates 86. The last session began Oct. 17, 1944 and ended June 22, 1945. The subsequent session for sophomores, juniors and seniors began July 19, 1945; and will begin on Sept. 19, 1945 for freshmen. The Dean is Robert U. Patterson, M.D.

MASSACHUSETTS

Boston

BOSTON UNIVERSITY SCHOOL OF MEDICINE, 80 East Concord Street.—Organized in 1873 as a homeopathic institution. In 1874 the New England Female Medical College, founded in 1848, was merged into it. The first class was graduated in 1874. Became nonsectarian in 1918. Coeducational since organization. Army and Navy assignees are admitted on completion of the standard premedical A. S. T. P. and the V-12 programs. In 1945 civilian students are being admitted on the basis of two years of collegiate training. In 1946 civilian applicants will be required to present a minimum of three years of premedical work. The faculty includes 23 professors, 214 associate and assistant professors, instructors and others, a total of 237. The accelerated program will be continued as long as may be required by the Army and Navy. First year classes will start annually in September. Total fees average $600 per year. The registration for 1944-1945 was 248; graduates 65. The last session began Oct. 5, 1944 and ended June 9, 1945. The subsequent session for sophomores, juniors and seniors began June 29, 1945; freshmen will be enrolled Sept. 21, 1945. The Dean is Charles F. Branch, M.D.

HARVARD MEDICAL SCHOOL, 25 Shattuck Street, Zone 15.—Organized in 1782. The first class graduated in 1788. It has a faculty of 204 members, and 449 other instructors and assistants, a total of 653. Two years of collegiate work are required for admission. The accelerated program has been adopted. The fees average $600, plus $5 the first year for matriculation. The registration for 1944-1945 was 525; graduates 141. The last session began Oct. 2, 1944 and ended June 25, 1945. The subsequent session began on July 2, 1945 for sophomores and juniors; on June 25, 1945 for seniors; and freshmen will be enrolled Sept. 24, 1945. The Dean is C. Sidney Burwell, M.D.

TUFTS COLLEGE MEDICAL SCHOOL, 416 Huntington Avenue.—Organized in 1893 as the Medical Department of Tufts College. The first class graduated in 1894. Coeducational since 1894. It has a faculty of 107 professors and 352 instructors, lecturers and others, a total of 459. Four

academic years of college study are required for admission. An accelerated program has been adopted. The total fees for each of the four years, respectively, are $512, $507, $507 and $517. The registration for 1944-1945 was 410; graduates 97. The last session began on Oct. 2, 1944 and ended June 2, 1945. The subsequent session began in July 1945 for sophomores, juniors and seniors; and will begin on Sept. 17, 1945 for freshmen. The Acting Dean is Dwight O'Hara, M.D.

MICHIGAN

Ann Arbor

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL.—Organized in 1850 as the University of Michigan Department of Medicine and Surgery. The first class graduated in 1851. Present title assumed in 1915. Coeducational since 1870. It has a faculty of 28 professors, 19 associate professors, 31 assistant professors, 89 assistants, instructors and lecturers, a total of 167. The entrance requirements are ninety semester hours. An accelerated program has been adopted. The fees average $280 per academic year; for nonresidents $450 a year. The registration for the last session was 589. The last freshman class was enrolled Oct. 30, 1944. The next class for freshmen will begin Oct. 29, 1945. The Dean is A. C. Furstenberg, M.D.

Detroit

WAYNE UNIVERSITY COLLEGE OF MEDICINE, 1516 St. Antoine Street.—Organized as the Detroit College of Medicine in 1885 by consolidation of the Detroit Medical College (organized in 1868) and the Michigan College of Medicine (organized in 1879). Reorganized with the title of Detroit College of Medicine and Surgery in 1913. The first class graduated in 1869. In 1918 it became a municipal institution under the control of the Detroit Board of Education. In 1934 the name was changed by action of the Detroit Board of Education to Wayne University College of Medicine, as a part of the program of consolidation of the Detroit city colleges into a university system. Coeducational since 1917. Entrance requirement is 60 semester hours from an accredited college or university for the duration of the war. The faculty consists of 46 professors, 302 lecturers and others, a total of 348. An accelerated program has been adopted. The fees average $361 for Wayne County residents, and for nonresidents, $454. The registration for 1944-1945 was 248; graduates 66. The last session began Oct. 2, 1944 and ended June 23, 1945. The present session began July 2, 1945. The Dean is Hardy A. Kemp, M.D.

MINNESOTA

Minneapolis

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL, Zone 14.—Organized in 1883 as the University of Minnesota College of Medicine and Surgery, reorganized in 1888 by absorption of St. Paul Medical College and Minnesota Hospital College. The first class graduated in 1889. In 1908 the Minneapolis College of Physicians and Surgeons, organized in 1883, was merged. In 1909 the Homeopathic College of Medicine and Surgery was merged. Present title in 1913. Coeducational since organization. The faculty includes 248 professors, of whom 93 are on full time appointment and 155 on part time, and 137 instructors, 28 of whom are on full time appointment and 109 on part time, a total of 385. An accelerated program has been adopted. The entrance requirements are three years of university work. Students are required to meet the requirements for a degree of B.S. or B.A. before receiving the degree of Bachelor of Medicine (M.B.), which is granted at the end of the course. The M.D. degree is conferred after a year of intern work, of advanced laboratory work, or of public health work has been completed. Total fees are $252 per academic year for residents and $477 for nonresidents. The registration for 1944-1945 was 452; graduates 132. The last session began Oct. 2, 1944 and ended June 15, 1945. The subsequent session began July 2, 1945. The Dean is Harold S. Diehl, M.D.

MISSOURI

St. Louis

ST. LOUIS UNIVERSITY SCHOOL OF MEDICINE, 1402 South Grand Boulevard, Zone 4.—Organized in 1901 as the Marion-Sims-Beaumont Medical College by union of Marion-Sims Medical College, organized in 1890, and Beaumont Hospital Medical College, organized in 1886. First class graduated in 1902. It became the Medical School of St. Louis University in 1903. The faculty is composed of 80 professors and 284 instructors and assistants, a total of 364. The completion of three years of college study is the minimum admission requirement but students presenting meritorious credits in excess of the minimum are accepted by preference. During the war period the minimal entrance requirements, however, are two years of college with 60 semester hours of credit. An accelerated program has been adopted. The fees average $536 per academic year. The registration for 1944-1945 was 536; graduates 136. The last session began on Aug. 28, 1944 and ended June 28, 1945. The subsequent session began June 29, 1945. The Dean is Alphonse M. Schwitalla, S.J., Ph.D.

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, Kingshighway and Euclid Avenue, Zone 10.—Organized in 1842 as the Medical Department of St. Louis University. The first class graduated in 1843. In 1855 it was chartered as an independent institution under the name of St. Louis Medical College. In 1891 it became the Medical Department of Washington University. In 1899 it absorbed the Missouri Medical College. Coeducational since 1918. The faculty comprises 162 professors and 341 lecturers, instructors and others, a total of 503. Three years of collegiate work for civilians is required. The B.S. degree in medicine is conferred at the end of the third or fourth year. An accelerated program has been adopted. The fees average $596. The registration for 1944-1945 was 367; graduates 100. The last session began on Oct. 5, 1944 and ended June 23, 1945. The subsequent session began July 9, 1945 for sophomores, juniors and seniors, and will begin on Sept. 27, 1945 for freshmen. The Dean is Philip A. Shaffer, Ph.D.

NEBRASKA

Omaha

CREIGHTON UNIVERSITY SCHOOL OF MEDICINE, 306 North Fourteenth Street, Zone 2.—Organized in 1892 as the John A. Creighton Medical College. The first class graduated in 1893. Present title in 1921. Coeducational since organization. It has a faculty of 79 professors and 76 instructors, lecturers and assistants, a total of 155. Sixty semester hours of collegiate work are required for admission. The B.S. degree in medicine is conferred at the end of the second year. An accelerated program has been adopted. The fees average $376 per academic year and $100 additional each year for students who had not taken the major part of their work at Creighton University. The registration for 1944-1945 was 247; graduates 59. The last session began on Sept. 28, 1944 and ended June 2, 1945. The subsequent session began July 6, 1945 for sophomores, juniors and seniors, and will begin on Sept. 28, 1945 for freshmen. The Dean is Charles M. Wilhelmj, M.D.

UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE, Forty-Second Street and Dewey Avenue, Zone 5.—Organized in 1881 as the Omaha Medical College. The first class graduated in 1882. It became the Medical Department of Omaha University in 1891. In 1902 it affiliated with the University of Nebraska, with the present title. The instruction of the first two years was given at Lincoln and of the last two at Omaha until 1913, when the work of all four years was transferred to Omaha. Coeducational since 1882. The faculty is composed of 78 professors and 54 lecturers and instructors, a total of 132. Two years of collegiate work are required for admission. An accelerated program has been adopted. The B.S. degree in medicine is conferred at the end of the second year. The fees average $250 per academic year. The registration for 1944-1945 was 330; graduates 76. The last session began Oct. 2, 1944 and ended June 16, 1945. The subsequent session began July 2, 1945 for sophomores, juniors and seniors; and will begin on Sept. 20, 1945 for freshmen. The Dean is C. W. M. Poynter, M.D.

NEW YORK

Albany

ALBANY MEDICAL COLLEGE, 47 New Scotland Avenue.—Organized in 1838. The first class graduated in 1839. It became the Medical Department of Union University in 1873. In 1915 Union University assumed eductional control. Coeducational since 1915. The faculty is composed of 87 professors and 109 instructors, assistants and others, a total of 196. The requirement for admission is three years of college work. For the duration students who have completed two years of college and who have the proper specific qualifications will be admitted. An accelerated program has been adopted. The fees average $536 per academic year. The registration for 1944-1945 was 184; graduates 40. The last session began Oct. 2, 1944 and ended June 16, 1945. The subsequent session began July 2, 1945. The Dean is R. S. Cunningham, M.D.

Brooklyn

LONG ISLAND COLLEGE OF MEDICINE, 350 Henry Street, Zone 2.—Chartered in 1930, was originally organized in 1858 as The Long Island College Hospital. From the collegiate department the first class was graduated in 1860 and the last class in 1930. The first class of the Long Island College of Medicine was graduated in 1931. It is coeducational. It has a faculty of 132 professors, associate, assistant, clinical and assistant clinical professors, and 228 lecturers, associates, instructors, assistants, and others, a total of 360. For the duration of the war two years of collegiate work, including specified courses, are required for admission for men in the armed services; three years for civilians. The medical course covers four academic years but is being given in three calendar years for the duration of the war. The fees average $610 per academic year. The registration for 1944-1945 was 417; graduates 100. The last session began on Oct. 2, 1944 and ended June 28, 1945. The subsequent session began June 25, 1945 for sophomores, juniors and seniors; and will begin on Sept. 24, 1945 for freshmen. The President and Dean is Jean A. Curran, M.D.

Buffalo

UNIVERSITY OF BUFFALO SCHOOL OF MEDICINE, 24 High Street.—Organized in 1846. The first class graduated in 1847. It absorbed the Medical Department of Niagara University in 1898. Coeducational since organization. The faculty is composed of 111 professors and 172 associates, assistants and others, a total of 283. The minimum requirement for admission is two years of collegiate work including certain prescribed science subjects. An accelerated program has been adopted. The fees

for the entire course are $2,000. The registration for 1944-1945 was 319; graduates 74. The present session began on Jan. 2, 1945 and will end on Sept. 22, 1945; seniors were enrolled from Oct. 2, 1944 to June 23, 1945. The next session for freshmen will begin Oct. 1, 1945. The Dean is Edward W. Koch, M.D.

New York

COLUMBIA UNIVERSITY COLLEGE OF PHYSICIANS AND SURGEONS, 630 West One Hundred and Sixty Eighth Street.—The medical faculty of Columbia College, then known as King's College, was organized in 1767. Instruction was interrupted by the War of the Revolution. The faculty was reestablished in 1792 and merged in 1814 with the College of Physicians and Surgeons, which had received an independent charter in 1807. In 1860 the College of Physicians and Surgeons became the Medical Department of Columbia College. This merger became permanent by legislative enactment in 1891. Columbia College became Columbia University in 1896. The medical school has been coeducational since 1917. The faculty is composed of 277 professors and 594 instructors, demonstrators and others, a total of 871. Three years of collegiate work are required for admission. During the war, the school will remain in session throughout the year and entering classes will be enrolled once a year. Fees average $538 per academic year. The registration for 1944-1945 was 463; graduates 114. The last session began on Oct. 5, 1944 and ended June 16, 1945. The subsequent session began on July 2, 1945 for sophomores, juniors and seniors; and will begin on Oct. 4, 1945 for freshmen. The Dean is Willard C. Rappleye, M.D.

CORNELL UNIVERSITY MEDICAL COLLEGE, 1300 York Avenue.—Organized in 1898. Coeducational since organization. First year teaching was given formerly to approximately one third of the class at Ithaca but in 1938 this division was discontinued and all instruction is now in New York City. The faculty is composed of 155 professors and 223 instructors, assistants and others, a total of 378. All students admitted are from approved colleges for premedical training. The requirement for admission is three years of college work. An accelerated program has been adopted. The fees average $622 per academic year. The registration for 1944-1945 was 317; graduates 77. The last session began Sept. 28, 1944 and ended June 26, 1945. The subsequent session began for sophomores, juniors and seniors on July 11, 1945; and will begin on Oct. 1, 1945 for freshmen. The Dean is Joseph C. Hinsey, Ph.D.

NEW YORK MEDICAL COLLEGE, FLOWER AND FIFTH AVENUE HOSPITALS, 1 East 105th Street.—Organized in 1858. Incorporated in 1860 as the Homeopathic Medical College of the State of New York. The title New York Homeopathic Medical College was assumed in 1869; the title New York Homeopathic Medical College and Hospital in 1887; the title New York Homeopathic Medical College and Flower Hospital in 1908; the title New York Medical College and Flower Hospital in 1936; the present title of New York Medical College, Flower and Fifth Avenue Hospitals, June 22, 1938. The first class graduated in 1861. Coeducational since 1919. Three years of college work are required for admission. An accelerated program has been adopted. It has a faculty of 97 professors and associate professors, 76 assistant professors, 305 lecturers and assistants, a total of 478. The fees average $683 per academic year. The registration for 1944-1945 was 434; graduates 94. The last session began on Oct. 2, 1944 and ended June 12, 1945. The subsequent session began on July 23, 1945 for sophomores, juniors and seniors; and will begin on Sept. 17, 1945 for freshmen. The President and Dean is J. A. W. Hetrick, M.D.

NEW YORK UNIVERSITY COLLEGE OF MEDICINE, 477 First Avenue, Zone 16.—The Medical Department of New York University (then called the University of the City of New York) was organized in 1841. In 1898 it united with the Bellevue Hospital Medical College, organized in 1861, under the name of University and Bellevue Hospital Medical College. In 1935 the name was changed to New York University College of Medicine. Coeducational since 1919. The faculty is composed of 233 professors, associate, assistant, clinical, associate clinical and assistant clinical professors and 362 lecturers, instructors and others, a total of 595. An accelerated program has been adopted. Entrance requirements are two years of study in an approved college of arts and sciences. The fees average $600 per academic session. The registration for 1944-1945 was 533; graduates 122. The last session began on Oct. 2, 1944 and ended June 18, 1945. The subsequent session began on July 9, 1945 for sophomores, juniors and seniors; and will begin on Oct. 1, 1945 for freshmen. The Acting Dean is Donal Sheehan, M.D.

Rochester

UNIVERSITY OF ROCHESTER SCHOOL OF MEDICINE AND DENTISTRY, 260 Crittenden Boulevard, Zone 7.—Organized in 1925 as the Medical Department of the University of Rochester. Coeducational since organization. The faculty is composed of 79 professors, 224 lecturers, assistants, instructors and others, a total of 303. The accelerated program has been adopted. For the duration of the national emergency, two years of collegiate work are required for admission. The fees average $500 per academic year. The registration for 1944-1945 was 258; graduates 61. The last session began on Oct. 2, 1944 and ended June 16, 1945. The subsequent session began July 2, 1945 for sophomores, juniors and seniors; and will begin on Oct. 1, 1945 for freshmen. The Dean is George H. Whipple, M.D.

Syracuse

SYRACUSE UNIVERSITY COLLEGE OF MEDICINE, 766 Irving Avenue, Zone 10.—Organized in 1872, when the Geneva Medical College, chartered in 1834, was removed to Syracuse, under the title "The College of Physicians and Surgeons of Syracuse University." Present title assumed in 1875, when a compulsory three-year graded course was established. The first class graduated in 1873 and a class graduated each subsequent year. In 1889 the amalgamation with the university was made complete. Course extended to four years in 1896. Coeducational since organization. The faculty is composed of 61 professors and 185 associate and assistant professors, lecturers and instructors, a total of 246. Two years of a recognized college course are required for admission. An accelerated program has been adopted. The fees average $600 per academic year. The registration for 1944-1945 was 199; graduates 47. The present session for freshmen, sophomores and juniors began Jan. 2, 1945 and will end Sept. 22, 1945; seniors were enrolled from Oct. 2, 1944 to June 24, 1945. The subsequent session for all classes will begin Oct. 1, 1945. The Dean is H. G. Weiskotten, M.D.

NORTH CAROLINA

Durham

DUKE UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1925. The first class was admitted Oct. 1, 1930. Coeducational. The faculty is composed of 13 professors and 141 associate and assistant professors, lecturers, instructors and assistants, a total of 154. The premedical requirement is three years of college work. The academic year consists of four quarters of twelve weeks each, which must be taken consecutively, with graduation in three calendar years. The B.S. degree in medicine may be conferred for special work after six quarters. Students are urged to spend three years in hospital or laboratory work after graduation and must give assurance satisfactory to the executive committee that they will spend at least two years. Active duty with the Army, Navy or Public Health Service can replace the second year. The fees are $450 for each year of three quarters. The registration for 1944-1945 was 298; graduates 75. During 1945 the quarters begin January 2, April 3, July 2, October 1 and end March 24, June 23, September 22, and December 22. The next freshman class will be enrolled Oct. 1, 1945. The Dean is Wilburt C. Davison, M.D.

Winston-Salem

BOWMAN GRAY SCHOOL OF MEDICINE OF WAKE FOREST COLLEGE, Zone 7.—Organized in 1902 at Wake Forest as a school offering only the first two years of the curriculum. In 1941 the school was moved to Winston-Salem and expanded to a complete four year medical school under its present name. Coeducational. Ninety semester hours of college work are required for admission. An accelerated program has been adopted. The faculty numbers 121, 14 of whom are on leave of absence in active military service. Tuition fees average $510 per year. The registration for 1944-1945 was 191; graduates 43. The last session began on Sept. 27, 1944 and ended June 20, 1945. The subsequent session began July 2, 1945 for sophomores, juniors and seniors; and will begin on Sept. 26, 1945 for freshmen. The Dean is C. C. Carpenter, M.D.

OHIO

Cincinnati

UNIVERSITY OF CINCINNATI COLLEGE OF MEDICINE, Eden and Bethesda Avenues.—Organized in 1909 by the union of the Medical College of Ohio (founded in 1819) with the Miami Medical College (founded in 1852). The Medical College of Ohio became the Medical Department of the University of Cincinnati in 1896. Under a similar agreement, March 2, 1909, the Miami Medical College also merged with the University when the title of Ohio-Miami Medical College of the University of Cincinnati was taken. Present title assumed in 1915. Coeducational since organization. Candidates for admission to the freshman class will be accepted in accordance with the Army and Navy plan for the training of medical students for the duration of the war. Liberal arts students of the University of Cincinnati may enroll for the seven year combined liberal arts and medical program. The B.S. degree is granted on the joint recommendation of the faculties of the College of Liberal Arts and Medicine at the end of the first medical year. The faculty consists of 112 professors, associate and assistant professors, 350 instructors, etc., a total of 462. During the period of the war emergency the college will operate on an accelerated program. Tuition is as follows: for legal residents of Cincinnati $500 a year plus breakage fees ($50 additional for those not legal residents). The registration for 1944-1945 was 326; graduates 81. The last session began on Sept. 5, 1944 and ended June 8, 1945. The present session for sophomores, juniors and seniors began June 4, 1945 and will end Feb. 16, 1946. The session for the freshman class will begin Oct. 8, 1945 and will end July 6, 1946. The Dean is Stanley Dorst, M.D.

Cleveland

WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE, 2109 Adelbert Road, Zone 6.—Organized in 1843 as the Cleveland Medical College in cooperation with Western Reserve College. The first class graduated in 1844. The school assumed the present title in 1881. In 1910 the

Cleveland College of Physicians and Surgeons was merged. Coeducational since 1919. The faculty includes 102 professors and 276 lecturers, assistants and others, a total of 378. The curriculum covers four scholastic years of 38 to 40 weeks each. During the war emergency, these are spaced so that the entire course will be completed in three calendar years. For the duration of the war, the entrance requirements for Army and Navy students have been reduced to two years of college work, however, civilian students are required to have three years of college work. The fees average $529 per academic year. The registration for 1944-1945 was 337; graduates 87. The last session began Aug. 28, 1944 and ended May 19, 1945, and on June 2, 1945 for the fourth year class. The subsequent session began on June 4, 1945 for sophomores, juniors and seniors; and will begin on Sept. 17, 1945 for freshmen. The Dean is Joseph T. Wearn, M.D.

Columbus

Ohio State University College of Medicine, Neil and Eleventh Avenues, Zone 10.—Organized in 1907 as the Starling-Ohio Medical College by the union of Starling Medical College (organized in 1847 by charter granted by the State Legislature changing the name from Willoughby Medical College, which was chartered March 3, 1834) with the Ohio Medical University (organized 1890). In 1914 it became an integral part of the Ohio State University with its present title. Coeducational since organization. The faculty consists of 94 professors, associate and assistant professors, 120 lecturers, instructors and assistants, a total of 214, of whom 78 are on military leave. Three years of collegiate work are required for admission. An accelerated program has been adopted. Tuition fees average $318 per academic year and $150 additional for nonresidents. The registration for 1944-1945 was 311; graduates 73. The last session began on Oct. 3, 1944 and ended June 18, 1945. The subsequent session began on June 19, 1945 for sophomores, juniors and seniors; and will begin on Oct. 2, 1945 for freshmen. The Dean is Charles A. Doan, M.D.

OKLAHOMA

Oklahoma City

University of Oklahoma School of Medicine, 801 North East Thirteenth Street, Zone 4.—Organized in 1900. Until 1910 gave only the first two years of the medical course at Norman, Oklahoma, after which a clinical department was established at Oklahoma City by taking over the Medical School of Epworth University. The first class graduated in 1911. Coeducational since organization. A new medical school building and a second teaching hospital became available in 1928, and since September of that year the entire four year course has been given in Oklahoma City. It has a faculty of 41 professors, 30 associate professors, 37 assistant professors and 105 associates, lecturers, visiting lecturers, instructors and assistants, a total of 213. Two years of college work are a prerequisite for admission during the war. After Jan. 1, 1946, the prerequisites will be raised to the prewar requirement of three years. The course covers four years of nine months each. An accelerated program has been adopted. Fees: $50 "maintenance and incidental fee" per semester. Other annual course fees average $122, $99.50, $57 and $47, in the order given, beginning with the freshman year. For students not residents of Oklahoma there is a tuition charge of $350 a year, plus laboratory and course fees as indicated for the different years. The registration for 1944-1945 was 287; graduates, 72. The last session began Sept. 25, 1944 and ended June 15, 1945. The next session will begin July 2, 1945 and end March 22, 1946. The Dean is Tom Lowry, M.D.

OREGON

Portland

University of Oregon Medical School, Marquam Hill, Zone 1.—Organized in 1887. The first class graduated in 1888, and a class graduated each subsequent year except 1898. The Willamette University Medical Department was merged in 1913. Coeducational since organization. It has a faculty of 91 professors and 164 lecturers, assistants and others, a total of 255. Entrance requirements are 82 semester hours of collegiate work. An accelerated program has been adopted. The total fees are, respectively, $380, $375, $370 and $376 for residents of Oregon, and $60 a year additional for nonresidents. The registration for 1944-1945 was 292; graduates 70. The last session began on Oct. 2, 1944 and ended June 23, 1945. The subsequent session began on July 2, 1945 and will end March 23, 1946. The Dean is D. W. E. Baird, M.D.

PENNSYLVANIA

Philadelphia

Hahnemann Medical College and Hospital of Philadelphia, 235 North Fifteenth Street, Zone 2.—Organized in 1848 as The Homeopathic Medical College of Pennsylvania. In 1869 it united with The Hahnemann Medical College of Philadelphia, taking the latter title. Assumed present title in 1885. The first class graduated in 1849. Coeducational beginning with 1941-1942 session. Two years of collegiate work in an approved college of arts and sciences are required for admission. It has a faculty of 113 professors and 114 lecturers, instructors, and others, a total of 227. An accelerated program has been adopted. Fees are, respectively, $527, $524, $524 and $547. The registration for 1944-1945 was 577; graduates, 123. The last session began on Oct. 2, 1944 and ended June 14, 1945. The subsequent session began July 9, 1945 for sophomores, juniors and seniors; and will begin on Oct. 1, 1945 for freshmen. The Chairman of the Faculty Executive Committee is William G. Schmidt, Ph.D.

Jefferson Medical College of Philadelphia, 1025 Walnut Street.—Organized in 1825 as the Medical Department of Jefferson College, Canonsburg, Pa. It was chartered with its present title in 1838. Classes have been graduated annually beginning 1826. In 1938 a separate university charter was granted without change of title, since which time it has continued under the direction of its own board of trustees. It has a faculty of 92 professors, associate and assistant professors and 232 associates, lecturers, demonstrators and intructors, a total of 324. The bachelor's degree requirement for admission has been suspended for the duration. An accelerated program has been adopted. The total fees are $450 a year. The registration for 1944-1945 was 607; graduates, 154. The last session began on Oct. 9, 1944 and ended June 18, 1945. The subsequent session for sophomores, juniors and seniors began July 16, 1945; freshmen will begin Oct. 1, 1945, The Dean is William H. Perkins, M.D.

Temple University School of Medicine, 3400 North Broad Street, Zone 40.—Organized in 1901. The first class graduated in 1904. Coeducational since organization. The faculty numbers 29 professors and 214 associates, assistants and others, a total of 243. An accelerated program has been adopted. Three years of collegiate work are required for admission. The fees average $492 per academic year. The registration for 1944-1945 was 496; graduates, 127. The last session began Oct. 2, 1944 and ended June 21, 1945. The present session began July 2, 1945 and will end March 21, 1946. The Dean is William N. Parkinson, M.D.

University of Pennsylvania School of Medicine, Thirty-Sixth and Pine Streets.—Organized in 1765. Classes were graduated in 1768 and in all subsequent years except 1772 and 1775-1779, inclusive. The original title was the Department of Medicine, College of Philadelphia. The present title was adopted in 1909. It granted the first medical diploma issued in America. In 1916 it took over the Medico-Chirurgical College of Philadelphia to develop it as a graduate school. Coeducational since 1914. The faculty consists of 135 professors, associate and assistant professors, and 449 lecturers, associates, instructors and others, a total of 584. Three years of collegiate work are required for admission. An accelerated program has been adopted. The tuition fee is $500 each year, with a deposit fee of $15, a general fee including student health of $15 and a matriculation fee of $5. The registration for 1944-1945 was 527; graduates 133. The last session began on Oct. 2, 1944 and ended June 18, 1945. The subsequent session began July 9, 1945 for sophomores, juniors and seniors; and will begin on Sept. 24, 1945 for freshmen. The Dean is William Pepper, M.D.

Woman's Medical College of Pennsylvania, Henry Avenue and Abbottsford Road, East Falls.—Organized in 1850. Classes were graduated in 1852 and in all subsequent years except 1862. It has a faculty of 82 professors and 75 assistants, lecturers and others, a total of 157. At least three years of collegiate work are required for admission and candidates with a degree are given preference. The curriculum covers four years of eight and one-half months each. Total fees are $500 yearly. The registration for 1944-1945 was 162; graduates 29. The last session for freshmen and sophomores began Sept. 6, 1944 and ended June 2, 1945; for juniors July 10, 1944 to March 24, 1945; for seniors April 24, 1944 to Jan. 10, 1945. The present session for fourth year students began April 23, 1945 and will end Jan. 10, 1946. The next session for first and second year students will begin Sept. 10, 1945 and for third year students, Sept. 14, 1945, and will end June 15, 1946. The Dean is Margaret D. Craighill, M.D., who is on leave of absence for military service. The Acting Dean is Marion Fay, Ph.D.

Pittsburgh

University of Pittsburgh School of Medicine, Bigelow Boulevard.—Organized in 1886, as the Western Pennsylvania Medical College and in 1908 became an integral part of the University of Pittsburgh, removing to the university campus in 1910. The first class graduated in 1887. Coeducation since 1899. The faculty is composed of 30 professors and 370 associates, assistants and others, a total of 400. Entrance requirements are two years of collegiate work. The total fees are $500 each year. An accelerated program has been adopted. The registration for 1944-1945 was 323; graduates, 77. The last session began on Oct. 2, 1944 and ended June 16, 1945. The subsequent session began on July 2, 1945 for sophomores, juniors and seniors; and will begin on Oct. 1, 1945 for freshmen. The Dean is William S. McEllroy, M.D.

SOUTH CAROLINA

Charleston

Medical College of the State of South Carolina, 16 Lucas Street, Zone 16.—Organized in 1823 as the Medical College of South Carolina. The first class graduated in 1825. In 1832 a medical college bearing the present title was chartered and the two schools continued as separate institutions until they were merged in 1838. Classes were graduated in all years except 1862 to 1865, inclusive. In 1913, by legislative enactment, it became a state institution. Coeducational from 1895 to 1912, when privileges for women were withdrawn, being restored in

1917. It has a faculty of 40 professors and 51 associates, instructors and others, a total of 91, of which 38 are on a full time basis. The accelerated program has been adopted. Two years of collegiate work are required for admission during the war, but normally this requirement is three years. The total fees are $422 each year for residents of South Carolina and $622 for nonresidents of the state. The registration for 1944-1945 was 198; graduates, 48. The last session began Oct. 2, 1944 and ended June 16, 1945. The subsequent session will begin June 25, 1945 for sophomore, junior, and senior classes; and Sept. 27, 1945 for the freshman class. The Dean is Kenneth M. Lynch, M.D.

TENNESSEE

Memphis

UNIVERSITY OF TENNESSEE COLLEGE OF MEDICINE, 874 Union Avenue, Zone 3.—Organized in 1876, at Nashville as Nashville Medical College. First class graduated in 1877, and a class graduated each subsequent year. Became Medical Department of University of Tennessee in 1879. In 1909 it united with the Medical Department of the University of Nashville to form the joint Medical Department of the Universities of Nashville and Tennessee. This union was dissolved in 1911. The trustees of the University of Nashville by formal action of that board named the University of Tennessee College of Medicine as its legal successor. In 1911 it moved to Memphis, where it united with the College of Physicians and Surgeons. The Memphis Hospital Medical College was merged in 1913. Lincoln Memorial University Medical Department was merged in 1914. Coeducational since 1911. The faculty includes 140 professors and 162 assistants, instructors and others, a total of 302. Two years of collegiate work are required for admission. The B.S. degree in medicine is conferred at the end of the second year. The fees are $120 quarterly. For residents of the state the charge is reduced $50 each quarter. The registration for 1944-1945 was 495; graduates, 70. During the next academic year the quarters begin September, January, March and June. The Dean is O. W. Hyman, Ph.D.

Nashville

MEHARRY MEDICAL COLLEGE, Eighteenth Avenue North and Meharry Boulevard, Zone 8. (For Negro Youth).—This school was organized in 1876 as the Meharry Medical Department of Central Tennessee College, which became Walden University in 1900. First class graduated in 1877. Obtained new charter independent of Walden University in 1915. Coeducational since 1876. The faculty is made up of 49 professors and 30 instructors and lecturers, a total of 79. Two years' work in a college of liberal arts are required for admission. Tuition fees are, respectively, $425, $415, $395 and $405 each year. The curriculum covers four academic years of thirty-six weeks each. In September 1942, Meharry Medical College instituted the quarter system. Meharry initiated an accelerated schedule in July 1943. The registration for 1944-1945 was 253. The present session began on Dec. 28, 1944 and will end Sept. 16, 1945. The subsequent session begins on Sept. 27, 1945. The Director of Medical Education is Murray C. Brown, M.D.; the Dean is Michael J. Bent, M.D.

VANDERBILT UNIVERSITY SCHOOL OF MEDICINE, Twenty-First Avenue South at Edgehill, Zone 4.—This school was founded in 1874. The first class graduated in 1875. Coeducational since 1925. The faculty numbers 255. For matriculation, civilian students must be graduates of collegiate institutions of recognized standing or seniors in absentia, who will receive the bachelor degree from their college after having completed successfully one year of work in the school of medicine. Army and Navy students will be accepted on completion of the Army or Navy premedical program. The course covers four academic years of nearly nine months each, but due to the accelerated program, the four year course is now completed in three calendar years. The fees average $465 per academic year. The registration for 1944-1945 was 199; graduates, 54. The last session began Sept. 18, 1944 and ended June 11, 1945. The subsequent session began for all classes on June 18, 1945 and will end March 9, 1946. The Dean is Ernest W. Goodpasture, M.D.

TEXAS

Dallas

SOUTHWESTERN MEDICAL COLLEGE OF THE SOUTHWESTERN MEDICAL FOUNDATION, 2211 Oak Lawn.—Organized 1943. The first class graduated March 20, 1944. Coeducational since organization. It has a faculty of 126 professors (including associate and assistant professors) and 60 instructors and assistants or a total of 186. The medical college is operated on an accelerated program offering three trimesters of eleven weeks each per academic year so that each beginning student graduates in three calendar years. Tuition for the academic year is $175 per trimester. Hospitalization and breakage charges are not included in this fee. Sixty to ninety semester hours are required for admission—depending on draft status. Registration for 1945 was 205. The present session began Jan. 2, 1945 and will end Sept. 15, 1945. The subsequent session will begin Oct. 1, 1945. The Dean of Faculty is Tinsley Harrison. M.D.; the Dean of Students is Donald Slaughter, M.D.

Galveston

UNIVERSITY OF TEXAS SCHOOL OF MEDICINE, 912 Avenue B.—Organized in 1891. The first class graduated in 1892. Coeducational since organization. It has a faculty of 72 professors (including associate and assistant professors) and 76 instructors and assistants, a total of 148. The Medical Branch is operating on an accelerated program offering four academic terms of nine months each for completion of the medical curriculum of thirty-six months. Seventy-two semester hours are required for admission. Ninety semester hours are required for the class to begin on or about Nov. 1, 1946. The fees average $92.50 per academic year, including health fees for medical care and hospitalization. The registration for 1944-1945 was 389; graduates, 109. The last session began on June 28, 1944 for freshmen and ended May 5, 1945; other classes Aug. 14, 1944 to June 2, 1945. The subsequent session for sophomores, juniors and seniors began on May 28, 1945; and will begin on Sept. 13, 1945 for freshmen. The Vice Pres. and Dean is Chauncey D. Leake, Ph.D.

Houston

BAYLOR UNIVERSITY COLLEGE OF MEDICINE, 509 Lincoln Street, Houston.—Organized in 1900 at Dallas as the University of Dallas Medical Department. In 1903 it took its present name and became the Medical Department of Baylor University. It acquired the charter of Dallas Medical College in 1904. The school was moved to Houston in 1943. Coeducational since organization. The first class graduated in 1901. Entrance requirements are 72 semester hours of collegiate work. The course covers four years of eight months each. An accelerated program was adopted beginning July 12, 1943. The fees are, respectively, $423, $413, $403, $428. The registration for 1944-1945 was 257. The present session began Nov. 20, 1944 and ended July 16, 1945. The subsequent session for freshman class will begin Sept. 3, 1945; other classes began July 30, 1945. The Dean is Walter H. Moursund, M.D.

UTAH

Salt Lake City

UNIVERSITY OF UTAH SCHOOL OF MEDICINE. Organized in 1906. Coeducational since organization. Four-year curriculum established March 1943. An accelerated program has been adopted. Three years of collegiate work are required for admission. The faculty is composed of 11 professors, 23 associate professors, 25 assistant professors, 31 instructors, and 12 lecturers; a total of 102. The fees for each quarter are $137.00; there is a nonresident fee of $55 each year. The registration for 1944-1945 was 158; graduates 38. The last session began on Sept. 13, 1944 and ended June 11, 1945. The subsequent session for sophomores, juniors and seniors began in June 1945, and will begin on Sept. 12, 1945 for freshmen. Address communications to Administrative Committee.

VERMONT

Burlington

UNIVERSITY OF VERMONT COLLEGE OF MEDICINE, Pearl Street, College Park.—Organized with complete course in 1822. Classes graduated in 1823 to 1836, inclusive, when the school was suspended. It was reorganized in 1853 and classes were graduated in 1854 and in all subsequent years. Coeducational since 1920. It has a faculty of 56 professors and 45 instructors, and assistants, a total of 101. Three years of college work are required for admission. An accelerated program has been adopted. For residents of Vermont the tuition fee is $400 each session. Nonresidents are charged an additional $150 each session. A $25 fee is charged for the doctor's degree. The last session began Sept. 25, 1944 and ended June 20, 1945; registration 149; graduates 36. The subsequent session began July 5, 1945 and will end April 3, 1946. The Dean is William Eustis Brown, M.D.

VIRGINIA

Charlottesville

UNIVERSITY OF VIRGINIA DEPARTMENT OF MEDICINE.—Organized in 1827. Classes were graduated in 1828 and in all subsequent years except 1865. Coeducational since the session of 1920-1921. An accelerated program has been adopted. It has a faculty of 49 professors and 46 lecturers, instructors, assistants and others, a total of 95. Two years of college work are required for admission. For residents of Virginia the total fees average $388 per academic year. Nonresidents are charged an additional $50 each year. The registration for 1944-1945 was 265; graduates 65. The last session began on Sept. 29, 1944 and ended June 23, 1945. The subsequent session began July 6, 1945 and will end March 23, 1946. The Dean is Harvey E. Jordan, Ph.D.

Richmond

MEDICAL COLLEGE OF VIRGINIA, Twelfth and Marshall Streets.—Organized in 1838 as the Medical Department of Hampden Sydney College. Present title was taken in 1854. In 1913 the University College of Medicine was merged. In 1914 the North Carolina Medical College was merged. Coeducational since 1918. Classes were graduated in 1839 and in all subsequent years. It has a faculty of 102 professors and 177

lecturers, instructors and others, a total of 279. Of this group 11 professors and 76 lecturers, instructors and others are on military leave. Two years of collegiate work are required for admission for those in the military services; three years of collegiate work are required for civilian students. An accelerated program has been adopted. Fees average $384 per academic year. Nonresidents are charged an additional $125 each year. The registration for 1944-1945 was 338; graduates 93. The last session began Oct. 9, 1944 and ended June 16, 1945. The subsequent session for sophomores, juniors and seniors began on July 9, 1945, and will begin on Oct. 1, 1945 for freshmen. The Dean is J. P. Gray, M.D.

WISCONSIN

Madison

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL, 418 North Randall Avenue, Zone 6.—Organized in 1907. Gave only the first two years of the medical course until 1925, when the clinical years were added. Coeducational since organization. The requirement of three years of collegiate work for admission has been reduced to two years for the duration. An accelerated program has been adopted for the duration. Beginning with Sept. 24, 1945 a class will be admitted once each year. It has a faculty of 64 professors and 67 lecturers, instructors and others, a total of 131. The fees average $206 per academic year. An additional fee of $200 per year is charged nonresidents. The registration for 1944-1945 was 288; graduates 70. The present classes began on Jan. 1, 1945 for freshmen, sophomores and juniors, and will end Sept. 22, 1945; for seniors, Aug. 28, 1944 to June 26, 1945. The next session for all classes will begin on Sept. 24, 1945. The Acting Dean is Walter J. Meek, Ph.D.

Milwaukee

MARQUETTE UNIVERSITY SCHOOL OF MEDICINE, 561 North Fifteenth Street.—Organized in December 1912 by the merger of the Milwaukee Medical College and the Wisconsin College of Physicians and Surgeons. Coeducational since organization. It has a faculty of 192. Three years of collegiate work are normally required for admission. During the duration students are admitted in accordance with the prescribed Army and Navy programs. The accelerated program includes three semesters each calendar year, an equivalent of four years of eight and a half months each in three calendar years. The fees average $525.00 per academic year. The registration for the present session is 366. The session began May 7, 1945 and will end March 1, 1946. The subsequent session for sophomores, juniors and seniors will begin Feb. 25, 1946; for freshmen June 24, 1946. The Dean is Eben J. Carey, M.D.

CANADA

Alberta

UNIVERSITY OF ALBERTA FACULTY OF MEDICINE, Edmonton.—Organized in 1913. Coeducational since organization. Has given the complete six-year medical course since 1924. New course—three years premedical, four years medicine, one year undergraduate internship for medical degree—has been offered beginning with the session 1942-1943. The faculty includes 15 full time and 69 part time professors, instructors and assistants and others, a total of 84, of whom 18 are absent on war service. Tuition for the first and second years is $255; for the third and fourth years $265 and for the fifth and old sixth year $263. The registration for 1944-1945 was 143; graduates 33. The next session (regular) will open on Sept. 17, 1945 for the first, second and third years, and on Oct. 1, 1945 (accelerated) for the fifth year. The Dean is Allan C. Rankin, M.D.

Manitoba

UNIVERSITY OF MANITOBA FACULTY OF MEDICINE, Bannatyne Avenue, Winnipeg.—Organized in 1883 as Manitoba Medical College; first class graduated in 1886, and a class graduated each subsequent year. The college transferred all its property to the University of Manitoba in 1919 and assumed the present title. Coeducational since organization. The faculty includes 36 professors and 103 instructors and assistants, a total of 139. Matriculation requirements include two years of collegiate work in the faculty of arts and science of a recognized university. An accelerated program was adopted but was discontinued with class entering in fall of 1943. The course extends over four years of eight months each and a hospital internship. The fees average $254 yearly. The registration for 1944-1945 was 183; graduates 55. The next session for the first four years will begin on Sept. 14, 1946; the fifth year began on July 16, 1945. The Dean is A. T. Mathers, M.D.

Nova Scotia

DALHOUSIE UNIVERSITY FACULTY OF MEDICINE, Morris Street, Halifax.—Organized in 1867. Incorporated as the Halifax Medical College in 1875. Reorganized as an examining faculty, separate from the Halifax Medical College, in 1885. In 1911, in accordance with an agreement between the Governors of Dalhousie University and the Corporation of the Halifax Medical College, the work of the latter institution was discontinued and a full teaching faculty was established by the university. First class graduated in 1872. Coeducational since 1871. It has a faculty of 45 professors and 36 demonstrators, lecturers and others, a total of 81, 14 of whom are in active service, and are on leave for the duration. Requires for matriculation two years of arts. The regular medical course covers four years and a hospital internship of one year. Beginning in 1942 the last three years of the medical course were given under the accelerated plan. The final year internship was reduced to eight months. On Jan. 6, 1944, Faculty decided to discontinue acceleration. The fees average $317 yearly; $250 additional registration fee payable by students outside the British Empire. The registration for 1944-1945 was 121; graduates 44. The next session for all classes will begin Sept. 12, 1945. The Dean is H. G. Grant, M.D.

Ontario

QUEEN'S UNIVERSITY FACULTY OF MEDICINE, Kingston.—Organized 1854. First class graduated in 1855, and a class graduated each subsequent year. The faculty numbers 62. Fees for the first year amount to $243, and for the following years $255. The course consists of five sessions of 30 teaching weeks, and a sixth year spent in a hospital designated by the University. The degrees of M.D., C.M. are not awarded until the end of the sixth year. The accelerated program has been abandoned, and the pre-war time-table has been resumed. Freshmen will be admitted annually. Registration for 1944-1945 was 224; graduates 43. The last session for freshmen began Sept. 25, 1944 and ended May 5, 1945. The next session will open on Oct. 1, 1945. The last convocation was held on Feb. 15, 1945, and another class will graduate in February 1946. The Dean is G. Spencer Melvin, M.D.

UNIVERSITY OF WESTERN ONTARIO MEDICAL SCHOOL, Ottaway Avenue, London.—Organized in 1881 as the Western University Faculty of Medicine; first class graduated in 1883, and a class graduated each subsequent year. Present title in 1923. The medical school has been under the control of the Board of Governors of the University of Western Ontario since 1913. Coeducational since 1913. The faculty numbers 101. The normal course of study covers two college years of nine months each and four years of ten months each in the Faculty of Medicine. The total fees to residents of Canada for the last four years respectively are $356, $356, $360 and $360; nonresidents are charged $646, $646, $650 and $650 for each of the last four years. The registration for 1944-1945 was 204; graduates 31. The last session for freshmen began Sept. 25, 1944 and ended May 5, 1945. The next session begins for all years except the first and fifth years Sept. 10, 1945, and ends June 15, 1946. The Dean is G. E. Hall, M.D.

UNIVERSITY OF TORONTO FACULTY OF MEDICINE, Toronto 5.—Organized in 1843 as the Medical Faculty of King's College. Abolished in 1853. Reestablished in 1887. In 1902 it absorbed Victoria University Medical Department, and in 1903 it absorbed the Medical Faculty of Trinity University. Coeducational since 1903. The B.Sc. (Med.) degree is conferred at the end of the third or sixth year. It has a faculty of 82 professors and 314 (including 87 on leave of absence for the duration of the war) lecturers, associates and others, a total of 396. The fees are $240 for the first year; for the second $315; $315 for the third year; $340 for the fourth and fifth years and $368 for the sixth year. The registration for 1944-1945 was 657; graduates 119. The last freshman class began Sept. 26, 1944 and ended May 12, 1945. The next first year class will begin the first premedical year on Sept. 25, 1945, to be followed by the second premedical year in 1946-1947. The first, second, third and fourth medical years will begin on Sept. 10, 1945 and end on June 1, 1946. Students in the final year graduated Feb. 16, 1945. Students will graduate annually in June thereafter. The Dean is W. E. Gallie, M.D.

Quebec

MCGILL UNIVERSITY FACULTY OF MEDICINE, 3640 University Street, Montreal.—Founded in 1823 as Montreal Medical Institution; became the Medical Faculty of McGill University in 1829; first class graduated under the university auspices in 1833. No session between 1836-1939, owing to political troubles. In 1905 it absorbed the Faculty of Medicine of the University of Bishop's College. Coeducational since 1919. Three years of collegiate work are required for admission. The faculty consists of 90 professors and 162 lecturers and others, a total of 252. The total fees for each of the four medical years are $391 plus $100 for non-British subjects. The registration for 1944-1945 was 314; graduates 91. The next session will begin Sept. 5, 1945 and will end June 1, 1946. The Dean is J. C. Meakins, M.D.

UNIVERSITY OF MONTREAL FACULTY OF MEDICINE, 2900 Mount Royal Boulevard, Montreal.—Organized in 1843 as the Montreal School of Medicine and Surgery. In 1891, by Act of Parliament, the Medical Faculty of Laval University (organized in 1878) was absorbed. Present name by Act of Parliament in 1920. A class was graduated in 1843 and each subsequent year. Coeducational since 1925. The faculty numbers 200. The requirements for admission are: First, a B.A. degree (or its equivalent); second, one year premedical in the faculty of pure sciences (or an entrance examination on the premedical subjects). An internship is required for graduation. The fees average $250 yearly. The registration for 1944-1945 was 307; graduates 56. The next freshman session will begin Sept. 15, 1945 and end in June 1946. The Dean is Edmond Dubé, M.D.

LAVAL UNIVERSITY FACULTY OF MEDICINE, Quebec.—The Quebec School of Medicine, organized in 1848, became in 1852 the Laval University Faculty of Medicine; first class graduated in 1855, and a class graduated each subsequent year. The faculty numbers 93. The fees for each of the medical years are $200 for residents of Canada. Nonresidents are charged an extra fee of $200 each year. The premedical requirement is a B.A. degree or its equivalent. The registration for 1944-1945 was 409; graduates 37. The next session will begin Sept. 14, 1945 and will end in May 1946. The Dean is Charles Vézina, M.D.

APPROVED SCHOOLS OF THE BASIC MEDICAL SCIENCES

ALABAMA

Birmingham

MEDICAL COLLEGE OF ALABAMA.—Established in 1943 as a division of the University of Alabama. Located in Birmingham in 1944. Approved for military trainees. In 1945 assumed title to Jefferson Hospital and Hillman Hospital, Birmingham, Alabama. The Medical College of Alabama cares for all indigent patients of the county and city, maintenance of which is paid to the University on a per diem basis by the County. In 1943 appropriation included one million dollars for the building of a new medical school which will be erected as early as possible after the war, and temporary quarters are now in the Jefferson and Hillman Hospitals. First instruction in The Medical College of Alabama started June 4, 1945, with junior class. On Oct. 8, 1945, the School of the Basic Medical Sciences on the University Campus, established in 1920, and its faculty will be absorbed into the new Medical College of Alabama. The medical college is coeducational. Minimum entrance requirements for civilian students are three years of college work. The accelerated program started June 8, 1942, and deceleration begins in 1945 with the first freshman class. The faculty of The Medical College of Alabama at this time includes seventy-three professors, instructors, assistants and others, of whom seven are absent in the armed forces. The Dean is Roy Rachford Kracke, M.D.

MISSISSIPPI

University

UNIVERSITY OF MISSISSIPPI SCHOOL OF MEDICINE.—Organized in 1903. Coeducational since organization. A clinical department was established at Vicksburg in 1908 but was discontinued in 1910 after graduating one class. An accelerated program has been adopted. Entrance requirement is three years of collegiate work or ninety semester hours of credit. The faculty includes 9 professors, 2 assistant professors, 1 adjunct professor, 17 instructors, assistants and others, a total of 29. The total fees for the first year are $375, and for the second year $348. The registration for the present session is 58. The session began on Jan 29, 1945 and will end Sept. 19, 1945. The next session will begin on Sept. 25, 1945 and will end May 25, 1946. The Acting Dean is B. S. Guyton, M.D.

MISSOURI

Columbia

UNIVERSITY OF MISSOURI SCHOOL OF MEDICINE.—Organized at St. Louis in 1845; was discontinued in 1855 but was reorganized at Columbia in 1872. Teaching of the clinical years was suspended in 1909. Coeducational since 1872. An accelerated program has been adopted. The faculty includes 26 professors and 12 instructors, lecturers and others, a total of 38. The entrance requirements are sixty semester hours of collegiate work. The B.S. degree in medicine is conferred at the end of the second year. Total fees for the first year are $266, for the second, $224. The registration for 1944-1945 was 75. The last session began on Sept. 16, 1944 and ended June 6, 1945. The subsequent session for sophomores began on June 9, 1945; and will begin on Sept. 22, 1945 for freshmen. The Dean is Dudley S. Conley, M.D.

NEW HAMPSHIRE

Hanover

DARTMOUTH MEDICAL SCHOOL.—Organized by Dr. Nathan Smith in 1797. The first class graduated in 1798. It is under the control of the trustees of Dartmouth College. Courses of the third and fourth year were discontinued in 1914. The faculty consists of 22 professors and 14 instructors, a total of 36. Army or Navy premedical curricula accepted for admission. An accelerated program has been adopted. Candidates for the A.B. degree in Dartmouth College may substitute the work of the first year in medicine for that of the senior year in the academic department. The tuition is $450 for each year. The registration for 1944-1945 was 45. The present session began on March 5, 1945 and will end Oct. 24, 1945. The subsequent session for both classes will begin Nov. 5, 1945. The Dean is Rolf C. Syvertsen, M.D.

NORTH CAROLINA

Chapel Hill

UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE.—Organized in 1890. Until 1902 this school gave only the work of the first two years, when the course was extended to four years by the establishment of a department in Raleigh. The first class graduated in 1903. A class was graduated each subsequent year, including 1910, when the clinical department at Raleigh was discontinued. Coeducational since 1914. Three years of college work are normally required for admission. Certificates are awarded on the completion of two years' work in medicine. The faculty is composed of 20 professors, 13 instructors, and 10 lecturers, a total of 43. The fees for each year are $298 for the first year and $323 for the second year for residents; for nonresidents an additional fee of $100 per year. The registration for 1944-1945 was 99. The last session began on Sept. 18, 1944 and ended June 9, 1945. The subsequent session for sophomores began on June 18, 1945; freshmen will be enrolled Sept. 17, 1945. The Dean is W. Reece Berryhill, M.D.

NORTH DAKOTA

Grand Forks

UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE.—Organized in 1905. Offers only the first two years of the medical course. Coeducational since organization. Three years work in a college of liberal arts are required for admission. (For the duration of the war about two years as per Army and Navy plans.) The B.S. degree in combined arts-medical course is conferred at the end of the second year. The faculty consists of 7 professors and 7 instructors, a total of 14. The fees are $170 each year for resident students and $340 for nonresidents. The registration, academic year Jan. 2, 1945 to Sept. 22, 1945, is 51. The subsequent session will begin Sept. 24, 1945 and end June 8, 1946. The Dean is H. E. French, M.D.

SOUTH DAKOTA

Vermillion

UNIVERSITY OF SOUTH DAKOTA SCHOOL OF MEDICAL SCIENCES.—Organized in 1907 as the University of South Dakota School of Medicine. Present title in 1937. Coeducation since organization. Offers only the first two years of the medical course. Two years work in a college of liberal arts are required for admission. Students who complete the third year of premedical work in the College of Arts and Sciences at the University of South Dakota may apply the work of the first year of medicine to the A.B. degree. The B.S. degree is conferred at the end of the second year on those students who do not hold a combination (Arts and Sciences and Medicine Course) A.B. degree. The faculty numbers 18. An accelerated program has been adopted. The tuition is $150 each year for residents and $255 for nonresidents. The registration for 1944-1945 was 48. The last session began Sept. 11, 1944 and ended June 3, 1945. The subsequent session for sophomores began June 11, 1945; freshmen will enrol on Sept. 17, 1945. The Dean is Joseph C. Ohlmacher, M.D.

WEST VIRGINIA

Morgantown

WEST VIRGINIA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1902, gives the first two years of the medical course, but agreement has been made for the transfer of 20 students each year to the Medical College of Virginia. Coeducational since organization. Entrance requirements are three years of collegiate work. The B.S. degree in medicine in conferred at the end of the second year. An accelerated program has been adopted. Faculty numbers 24. Fees for residents of the state are, respectively, $255 and $265; nonresidents, $150 additional each year. The registration for 1944-1945 was 55. The last session began Sept. 25, 1944 and ended June 16, 1945. The subsequent session begins for freshmen Sept. 24, 1945 and sophomores began their work on June 25, 1945. The Dean is Edward J. Van Liere, M.D.

CANADA

Saskatchewan

UNIVERSITY OF SASKATCHEWAN SCHOOL OF MEDICAL SCIENCES, Saskatoon.—Organized in 1926. Coeducational. Offers the first two years of the medical course. An accelerated program has been adopted. Two years of collegiate work are required for admission. The B.A. degree is conferred at the end of the second year. The medical faculty includes 8 professors and 7 lecturers and assistants, a total of 15. The fees are $150 for the first year and $200 for the second year. The registration for 1944-1945 was 49. The last session for freshman began Oct. 10, 1944 and ended May 11, 1945; for sophomores May 30 to Dec. 22, 1944. The next session for freshmen and sophomores will begin Oct. 1, 1945 and Sept. 10, 1945 respectively. The Dean is W. S. Lindsay, M.B.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, SEPTEMBER 1, 1945

THE EDUCATIONAL NUMBER, 1945

This forty-fifth annual Educational Number of The Journal of the American Medical Association presents data on the last wartime year in medical education, although the effects of the war will still be felt for a long time. All but ten schools have now completed the cycle of four graduating classes in three calendar years. During these three years there have been 20,662 graduates in the United States, which is 5,127 more than in the three years preceding the war.

This contribution of medical schools to the war is especially noteworthy, since it came at a time when faculties were depleted in numbers and the demands on the time and energy of those remaining were excessive.

The statistics and information contained in this Educational Number of The Journal are a continuation of this valuable annual service of the Council on Medical Education and Hospitals of the American Medical Association. Many groups, agencies, institutions and individuals have contributed to this compilation. Sincere thanks are due them, not only from the Council and The Journal, but from the many thousands of people interested in medicine and medical education who find this publication useful.

NEW MEDICAL SCHOOLS

The past year has seen the expansion of the University of Alabama School of Medicine from the two year to the four year status, and the formulation of plans and the appropriation of funds for a new medical school by the University of Washington in Seattle. Progress thus far seems to promise well for the success of both programs.

Considerably less may be said of the prospects of some of the other proposed ventures into the extremely costly field of medical education. Every state operating a school of the basic medical sciences is now considering expansion to a full four year medical school course. Some of the reasons given for such programs are not always sound. They include the following: Great numbers of physicians are away on military duty. New schools are required to supply the overall increase of physicians needed in this country after the war. Rural areas have too few physicians. None of these is an adequate reason for attempting to establish new medical schools.

Too often the proposals fail to recognize that medical education is the most expensive form of professional training; that a four year medical school costs far more to operate than a school of basic medical sciences; that there is a strong trend toward the employment of full time clinical instructors; that a physician needs teaching experience and training in addition to his M.D. degree to qualify as a teacher, even in clinical fields; that medical school hospitals must be specially designed and equipped; that medical schools must carry out research; finally, that medical schools must be so located as to insure an adequate supply of patients and of teachers, including specialists.

This kind of faulty thinking and lack of knowledge about medical education can only lead to costly and futile ventures which fail to reach the desired ends.

THE SUPPLY OF MEDICAL STUDENTS

Before the war ended, it was generally known that there would be a deficiency in numbers or quality of the men enrolled in freshmen medical classes in the near future, because exceedingly few able bodied men have been permitted to carry on premedical studies. The ending of the war has not changed this situation; it merely permits an estimate of the duration of deficient enrolments. If inductions are stopped in time for large numbers of medical students to enroll in the fall college sessions—which seems unlikely—there may be an approximation to the normal number of qualified medical school applicants in 1947. This may not come until 1948, since there must be added to the one lost premedical year still another year, because of the general shift from the two year to the three year requirement for admission.

Most medical schools are returning to annual admissions, even though acceleration will be continued after admission, at least as long as there are military students in the schools. When and how the A. S. T. and Navy V-12 medical programs will be discontinued has not been announced. Unless there is coordination between the Army and Navy and unless the medical schools are consulted through the liaison committee of the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges, a great deal of needless confusion is certain to result in this process.

Another factor is the rate of demobilization. Every indication is that this cannot be sufficiently rapid to return many qualified premedical students to their civilian studies until late winter or spring unless a special

adjustment is made. The Vannevar Bush report to the President recommends that qualified premedical (and other science) students "be ordered, by name, to duty in the United States as students." This plan "should be adopted as the considered policy of the armed forces, and no desire of a commanding officer . . . should be allowed to interfere with the operation of the policy." Such assignment "would be no disruption of plans for the discharge of soldiers . . ." because, in the course of the assignment to premedical studies on active duty, the discharge of such students "would occur in accordance with the already established rating scale."

Mr. Paul V. McNutt, chairman of the War Manpower Commission, announces a federal program with an immediate goal of the registration of qualified veterans in medical and premedical schools for courses starting this fall. Provided the veterans are selected by the medical schools, this program is in keeping with the objectives of the Council on Medical Education and Hospitals of the American Medical Association to encourage the development of adequately trained physicians to the end that the country will be satisfactorily supplied with medical service.

Mr. McNutt's release properly emphasizes the point that veterans must be suitably equipped with educational and other prerequisites to become future physicians; the number of medical students which can be accepted in any one year is also conditioned by the facilities available.

With the war now over, such replacements as are still needed for the armed services can well come from inductees not qualified to prepare for medical and scientific careers, and men on duty who should undertake such studies ought to be returned at the earliest moment.

PREVENTION OF PELLAGRA

Casal in 1735 argued that pellagra was due to some toxic or infectious factor in corn. Then in 1925 Goldberger [1] reported evidence that the disease is presumably due to inadequate amounts of some essential nutritional factor in corn. Elvehjem and his associates [2] afterward isolated this essential factor and identified it as nicotinic acid. In confirmation of the Goldberger theory nicotinic acid was afterward found to be clinically effective against blacktongue in dogs and against many (but not all) pellagra symptoms in man.

As analytic methods were perfected, the deficiency theory was challenged. On a dry weight basis corn contains as much nicotinic acid as eggs, milk, polished rice, oats or rye, and often more. The presence of an unknown pellagra producing toxin in corn was thus indicated. In confirmation of this toxic theory Handler [3] of Duke University found that the blacktongue syndrome in dogs is more readily produced on diets containing corn than with purified rations which contain much less nicotinic acid. Krehl and his associates [4] of the University of Wisconsin afterward noted that corn exerts a pronounced retardation of growth in rats which is counteracted by nicotinic acid. Polished rice or rolled oats, both of which contain significantly less nicotinic acid than corn, did not produce depression of growth when fed under identical conditions.

In order to determine the mechanism of this depression of growth, Krehl [5] made careful studies of the effects of corn grits on the nicotinic acid requirements of dogs. The experiments were conducted with growing dogs which had been kept since weaning on a synthetic diet low in nicotinic acid. Corn grits were incorporated in the synthetic ration at a level of 60 per cent at the expense of sucrose. Enough nicotinic acid was then added to adjust the level to 2 mg. per hundred cubic centimeters for one group of dogs and to 5 mg. per hundred cubic centimeters for a second group. Based on a daily consumption of 35 Gm. per kilogram, the two groups received each day 0.42 and 1.05 mg. of nicotinic acid per kilogram of body weight. The lower figure was at least 25 per cent higher than the minimum nicotinic acid requirement for growing dogs.[6]

By the end of fifty-one days the average growth of the dogs on the higher level of nicotinic acid was 77 Gm. per day. For the group at the lower nicotinic acid level the average daily growth was 37 Gm. In a control group of dogs fed a ration containing only 36 per cent corn grits the growth rate averaged 65 Gm. per day at the lower level. This was quite comparable to the 77 Gm. daily average with dogs maintained at the higher (luxury) level of nicotinic acid.

From these and similar data Krehl concludes that corn significantly increases the nicotinic acid requirement of growing dogs. The simplest explanation of this effect would be to assume that corn contains some relatively indigestible substance (or factor) which combines with dietary nicotinic acid so as to prevent its absorption from the digestive tract. This would be in line with the known effects of charcoal, liquid petrolatum and egg white. "Avidin," the undigestible factor in egg white, has a specific affinity for biotin. Fed in sufficiently large amounts, "avidin" causes lethal biotin starvation. Other more complex theories of the antivitamin effects of corn are suggested by the known synthesis or destruction of nicotinic acid by the intestinal flora. While corn tends to increase the nicotinic acid requirement of dogs, Krehl found that other foods, such as milk, casein and glucose, which contain much

1. Goldberger, Joseph, and Tanner, W. F.: Pub. Health Rep. **40:** 54 (Jan. 9) 1925.
2. Elvehjem, C. A.; Madden, R. J.; Strong, F. M., and Woolley, D. W.: J. Biol. Chem. **123:** 137 (March) 1938.
3. Handler, Philip: Proc. Soc. Exper. Biol. & Med. **52:** 263 (April) 1943.
4. Krehl, W. A.; Teply, L. J., and Elvehjem, C. A.: Science **101:** 283 (March 16) 1945.
5. Krehl, W. A.; Teply, L. J., and Elvehjem, C. A.: Proc. Soc. Exper. Biol. & Med. **58:** 334 (April) 1945.
6. Schaefer, A. E.; McKibbin, J. M., and Elvehjem, C. A.: J. Biol. Chem. **144:** 679 (Aug.) 1942.

less nicotinic acid, tend to decrease this requirement. Krehl believes that this reduced nicotinic acid requirement is due to the establishment of an adequate nicotinic acid synthesizing intestinal flora.

Summarizing his results, Krehl concludes that on a heavy corn grit diet the nicotinic acid requirements of man are probably at least three times the requirements for comparable growth on a synthetic diet or whole milk ration. From this he suggests that the enrichment of corn meal and other milled corn products should be increased to include considerably more nicotinic acid than is at present thought necessary. Krehl's data also suggest that the same prophylactic effects could be obtained by increasing the amount of milk or milk products in daily human diets.

VITAMIN IMBALANCE

With the introduction of pure vitamins, particularly members of the B complex, interest in the possibility of interrelation of vitamin activity has been stimulated. In the clinical literature are suggestions of the possible interrelation or antagonism of some of the B vitamins. Pellagrins often show symptoms of thiamine or riboflavin deficiency after receiving nicotinic acid; the added niacin may either increase the thiamine or riboflavin requirement of the pellagrin or actually antagonize the effect of the small amounts of the other B vitamins present. In addition, the possibility of producing an improper balance of vitamins should also be considered. This may now be easy to achieve, since there are many pure preparations of vitamins available allowing for the administration of unphysiologic doses of a given vitamin.

Early attempts to produce a deficiency of one of the B vitamins by overdosing with other members of the complex have not met with much success. Recently Richards [1] has demonstrated that overloading the diets of rats on a diet low in vitamin B_6, pyridoxine, with large amounts of thiamine caused vitamin imbalance, with the consequent production of symptoms of pyridoxine deficiency—seizures of epileptiform nature which made its diagnosis relatively simple. Other investigators have shown that these symptoms are present in young rats nursed by mothers that consumed a ration poor in pyridoxine. By the administration of pyridoxine to the mother after parturition, the seizures could be prevented in the young. The work illustrates strikingly that a pyridoxine deficiency is caused in rats by feeding large doses of thiamine. The possibility of the antagonism of other B factors by excess of thiamine may exist, but the symptoms of pyridoxine deficiency overshadowed other possible deficiency signs.

Najjar and Holt [2] have shown that there is a fluorescent substance in the urine of normal subjects but lacking in the urine of pellagrous patients. Later Najjar and his associates [3] showed that the fluorescent factor appeared to be a derivative of nicotinamide, the butyl ether of N-methylnicotinamide alpha carbinol. Thus the amount of fluorescent material in the urine parallels the amount of nicotinamide or nicotinic acid in the urine. Recently Signal, Hall and Sydenstricker [4] observed that the amount of fluorescent substance in the urine was increased by the administration of pyridoxine to normal dogs and to those maintained on a diet deficient in niacin. This signifies that the amount of nicotinic acid in the urine is increased. The administration of large doses of pyridoxine also increased the severity of the nicotinic acid deficiency.

With more knowledge of the interactions of vitamins, the possibility of vitamin imbalance must be considered. Indiscriminate administration of large amounts of individual members of the B complex, particularly thiamine, may lead to other vitamin deficiencies. The addition of vitamins as in the fortification of foods should also be considered in regard to the possibility of vitamin imbalance. Balancing of the vitamins may be of considerable clinical importance, particularly in diets of those in low economic levels or in the highly restricted diets of food faddists or patients with allergy.

1. Richards, Marion B.: Brit. M. J. **1**: 433 (March 31) 1945.
2. Najjar, V. A., and Holt, L. E., Jr.: Science **93**: 20 (Jan. 3) 1941.
3. Najjar, V. A.; White, Virginia, and Scott, D. B. M.: Bull. Johns Hopkins Hosp. **74**: 378 (June) 1944.
4. Singal, S.; Hall, W. K., and Sydenstricker, V. P.: Am. Chem. Soc. 108th meeting, Abstracts of Papers, 7 B, 1944.

Current Comment

CHILD SPACING AND STILLBIRTHS

Eastman [1] recently suggested that youth is a better ally than child spacing to the health of the mother and her child. This conclusion was based on an analysis of over 5,000 Baltimore births. Now, however, Yerushalmy,[2] who has made a statistical study of more than 7 million births, comes to a different conclusion. He found that the lowest stillbirth rates do not occur among the youngest mothers where "youth" might be expected to be the dominant factor. The rate is relatively high for mothers between the ages of 15 and 19 years (33.7) and drops to 23.3 for mothers between 20 and 24, increasing thereafter with the age of the mother to 56.2 in the 40 to 44 age bracket. The rate of stillbirths varies also according to the number of children born: there is a definitely lowered stillbirth rate for the sixth child of a mother aged 30 than for the sixth child of a mother aged 20. The eighth child born to a woman by the time she is 25 has a much higher stillbirth rate than a fourth child born to a woman the same age. Yerushalmy did not determine how much time should elapse between the birth of one baby and the beginning of another pregnancy by women of different ages and number of children. However, his observations emphasize that a period of rest and recuperation is essential to the average woman and that babies born either too close

1. Eastman, Nicholson J.: The Effect of the Interval Between Births on Maternal and Fetal Outlook, Am. J. Obst. & Gynec. **47**: 445 (April) 1944.
2. Yerushalmy, Jacob: Human Biology, May 1945.

together or at too wide intervals have less chance of being born alive than those spaced at moderate intervals. Furthermore, Yerushalmy concludes that the interval between births is a basic factor in the incidence of stillbirth. Although at first glance the Eastman and Yerushalmy studies appear to give conflicting results, it is not certain that they cannot be reconciled. Probably the age of the mother, child spacing and total number of children would all influence not only the incidence of stillbirths but also the maternal health.

RESIDENCIES FOR PHYSICIAN VETERANS

For many months the Committee on Postwar Medical Service and the various American boards in the specialties have been working with the Council on Medical Education and Hospitals of the American Medical Association to provide additional residency places of high quality for returning veterans seeking such work. At present there are nearly two thousand places available in excess of those open in 1943. These have already been approved by the Council, after inspection of the facilities, and are acceptable to the American boards. They will go a long way toward meeting the increased postwar demand for advanced hospital training. Many more hundreds of openings will be available by the time the peak of demobilization is reached. There is every indication that hospitals and medical schools will meet the educational needs at this level. There still remains the necessity for the organization of more full time courses of three months' duration of these two kinds: a general review of the major fields of clinical medicine for the general practitioner and review courses in the various specialties for physicians whose interests are primarily in one field and who wish a refresher course to bring them up to date.

EXAMINATION OF AIRPLANE PILOTS

Experience in the medicine of aviation in the United States before the war led experts who are members of the Aero Medical Association and of the medical division of the Civil Aeronautics Administration to establish high standards of qualification for the examination of airplane pilots. On June 1 the Civil Aeronautics Administration cut the examination of private and student pilots to a minimum. Previously only qualified examiners were permitted to make such examinations. Now the examinations may be made not only by general practitioners but even by osteopaths who happen to be licensed to practice medicine in any of the states. This reversal of policy is so fraught with danger to the flying public and to the millions of persons who will be hazarding their lives in flight in the postwar period that experienced examiners now qualified particularly in this field threaten to discontinue their connection with the CAA. The Congress of the United States has placed on the CAA the duty of regulating and controlling aviation so as to "assure the highest degree of safety." By this backward step a federal agency is apparently permitting selfish and political pressures to force on it a disregard of the high obligation committed to it by the Congress.

THE MEDICAL SCHOOL CURRICULUM

The present time is most propitious for serious curriculum revision. In recent years virtually no changes have been made by most schools except for the unstudied addition of required hours, which is the easiest and least rational kind of change. The medical school curriculum should be completely overhauled, bearing in mind the almost universal need for reducing the didactic assignments throughout the four years, allowing students free time for special interests, reducing the mass of detail required of students, integrating the work of the various departments intelligently, utilizing the case method of clinical instruction more extensively, elevating the clinical student to a position of dignity above that of a school boy, instilling in students an impelling curiosity about the unknown and incorporating studies of medical economics and the distribution of medical care into medical education. Unless progress is made along these lines, medical education will continue to lag far behind the advances which have been made in general education in recent years.

CELLULAR PATHOLOGY

Paul Klemperer[1] reviews briefly in a recent article the results of certain investigations in cellular pathology. As yet results of immediate practical value have not come from the study of the intracellular network known as the Golgi apparatus. It seems clear, however, that this apparatus is definitely related to the functions of exocrine as well as endocrine gland cells in that its size increases in the course of their secretory activity. More strikingly significant is the disappearance of the granules in the B cells of the islands of Langerhans in experimental alloxan diabetes. The outcome of the study of the granules in the human pancreas under various conditions will be of much interest. The demonstration of the changes in the cells of the hypophysis on removal of other endocrine glands or on hormonal injection is a second example of morphologic study in experimental endocrinology. Klemperer next turns attention to the juxtaglomerular neuromyoarterial apparatus, composed of epithelioid cells, concerning the function of which, whether secretory or regulatory, there is difference of opinion. The visual demonstration of intracellular enzyme activity is another phase of cell morphology. Mention may be made only of the results bearing on the formation of pigment in the body and on phosphatase activity of certain cells. In respect to the latter, further study of human material promises valuable results. Of the structural changes in avitaminosis Klemperer discusses the keratinizing metaplasia in vitamin A deficiency and the failure of connective tissues to produce and keep up intercellular substances in vitamin C deficiency. This effect of C deficiency is of great interest in relation to the alterations in the connective tissue in acute rheumatic fever, disseminated lupus and scleroderma. This review, though limited to particular lines of work, illustrates well the importance that cellular pathology maintains in medical science.

1. Klemperer, Paul: Recent Advances in Cellular Pathology, J. Mount Sinai Hosp. **12**: 416 (May-June) 1945.

MEDICINE AND THE WAR

ARMY

PLASTIC EYE CENTERS FOR ARMY MEDICAL DEPARTMENT

Thirty installations, twenty-nine general hospitals and one regional hospital, have been designated plastic eye centers for the Army Medical Department. All existing laboratories have adequate space, personnel and supplies, with the exception of one general hospital, and action is being taken to expand the facilities so that production can be increased at this establishment. Approximately 5,100 plastic artificial eyes were made and fitted up to June 30, 1945. In addition, the plastic eye laboratories have made conformers, eye spheres and other appliances for the eye clinics.

Experimental work is still being carried on in the plastic artificial eye program. Technicians are continually endeavoring to improve and give these plastic eyes greater mobility and lessen abrasion. Three teams of officers and enlisted men who are experienced in making plastic artificial eyes are overseas, and four additional teams are now being trained in this work.

AWARD OF MERITORIOUS SERVICE UNIT PLAQUE

The Meritorious Service Unit Plaque was recently awarded to the Medical Detachment, 271st Infantry Regiment, 69th Infantry Division, United States Army, "for superior performance of duty in the accomplishment of exceptionally difficult tasks from Feb. 11, 1945 to May 7, 1945 in Belgium and Germany. The Medical Detachment has demonstrated its unusual skill in coping with intricate and difficult situations. Through its brilliant professional attainment the Medical Detachment has achieved an enviable record. One thousand one hundred and fifty-five soldiers have been treated at aid stations without the occurrence of a single death. Casualties from the battlefield were evacuated in the record time of ninety-two minutes. Despite the most severe weather conditions and heavy enemy action, the Medical Detachment displayed the greatest adaptability and resourcefulness. The ability, courage and devotion to duty displayed by the Medical Detachment reflect the highest credit on this unit and the armed forces of the United States." The commanding officer of the medical detachment is Major Leo Litter, formerly of New York.

DEDICATE MADIGAN GENERAL HOSPITAL

The Madigan General Hospital, Tacoma, Wash., was recently dedicated. Formerly Fort Lewis Hospital, the Surgeon General requested on May 18, 1944 that this installation be converted to a general hospital for the medical department. Madigan General Hospital is named for Col. Patrick S. Madigan, formerly of the medical corps of the United States Army. He died May 8, 1944 while stationed at Fort Belvoir, Virginia. Colonel Madigan graduated from Georgetown University School of Medicine, Washington, D. C., in 1912 and was commissioned in the Medical Corps of the Regular Army on Oct. 21, 1917.

38th GENERAL HOSPITAL AWARDED PLAQUE

The 38th General Hospital of the Jefferson Medical College, now in Cairo, Egypt, was recently awarded the Meritorious Service plaque. The citation was made by the commanding general of the African Middle East Theater, who cited the unit for superior performance of duty in the accomplishment of exceptionally difficult tasks and for the maintenance of a high standard of discipline from January 1944 to July 1944. The 38th Hospital Unit is in command of Lieut. Col. Robert B. Nye.

ARMY AWARDS AND COMMENDATIONS

Major Francisco A. Rosete

The Bronze Star was recently awarded to Major Francisco A. Rosete, formerly of Chicago. A captain in rank during this period, and responsible for the 55,000 Filipino civilians, Major Rosete organized and supervised twenty-three dispensaries and eight hospitals in the northern Luzon sector. Because the Japanese had furnished no medicines or medical aid for these civilians during their three years of occupation, disease was rampant with various types of maladies, many of them in the last stages owing to the lack of previous attention. Major Rosete, with untiring energy and drive, obtained the necessary medicines and equipment for taking care of these diseases, and through his initiative and efforts they have been cured and are on the decline. In performing his duties he has worked long hours, tirelessly tending the bodily ills of the diseased civilians and frequently with little or no help from other trained personnel.

Besides curing diseases, part of his work has been that of prevention. He has been a crusader in cleaning up filth and breeding grounds of diseases. He has tried to educate the civilian population to maintain higher standards of sanitation and has appointed and supervised sanitary inspectors who require the civilians to improve their living conditions through this preventive measure.

"In curing and preventing diseases among the civilians, Major Rosete has reduced the danger of infection and diseases among the members of the 33d Infantry Division, because of the fraternization between the civilians and the military. In this respect he has aided the 33d Division in the accomplishment of its tactical missions," the citation read in part. Dr. Rosete graduated from Loyola University School of Medicine, Chicago, in 1938 and entered the service Aug. 26, 1942.

Captain Joseph H. Hillman

The Bronze Star was recently awarded to Capt. Joseph H. Hillman, formerly of New York, "for meritorious service in connection with military operations against the enemy as anesthetist, 3d Auxiliary Surgical Group, from June 7, 1944 to Nov. 17, 1944 in France, Belgium and Germany. Since his arrival on the European continent Captain Hillman has displayed marked proficiency and professional skill in the administration of innumerable anesthetics and in the improvisation of equipment which permitted the performance of major surgical operations in a division clearing station. By his demonstration of outstanding medical ability and personal initiative, Capt. Hillman reflected credit on himself and the military service." Dr. Hillman graduated from the New York University College of Medicine, New York, in 1930 and entered the service Aug. 1, 1942.

Major John Erbes

Major John Erbes, formerly of Windsor, Colo., has been the recipient of a Distinguished Service Cross, four Silver Stars and a Bronze Star. As a battalion and regimental surgeon, Major Erbes served in the heat of every major European battle from Africa to Germany with the Panzer tamer "Hell-on-Wheels" 2d Armored Division. Decorated the first time in Africa with a Silver Star for "stealing a half-track, loading it with wounded and running them to safety while Nazi tanks fired and chased us all over the desert," he established a standard pattern for himself which was to distinguish his actions in France, Belgium and Germany. The nation's second highest military award, the Distinguished Service Cross, was won for another courageous rescue near Aachen. Leading three men into an open bullet and shell scourged field where a dozen wounded lay surrounded by

Germans, Erbes bore a Red Cross flag, in accordance with Geneva conference rules. "Artillery fire continued, however," he stated, "and I was just about to dive into a hole when some guy with a machine gun cut down on me, sending bullets through the flag and chipping the staff. It furnished the impetus to really put me in that hole. After a while most of the small arms fire died down, but the artillery kept pounding." Major Erbes recruited "help from the foxholes" as litter carriers and with them made four 1,600 yard trips through the avalanche of artillery fire. Some of the men were so seriously wounded that he was forced to perform amputations with only a bandage scissors. Dr. Erbes graduated from the University of Nebraska College of Medicine, Omaha, in 1939 and entered the service July 1, 1941.

Brigadier General John A. Rogers

The Distinguished Service Medal was recently awarded to Brig. Gen. John A. Rogers, formerly of Washington, D. C. Accompanying the award was the citation "As Surgeon of the First Army in France, Belgium and Germany from June 1944 to April 1945 he demonstrated rare organizational ability and exceptional judgment in his superior handling of the First Army's medical service. Energetically pursuing the army commander's principle of placing hospitals as near the line of combat as possible, he overcame with highly ingenious methods the difficulties presented by the greatly augmented army racing across western Europe and covering an unusually extended front. In cooperation with the Air Forces and Navy he developed highly effective procedures for evacuating the wounded by aircraft and boats. Despite all obstacles he furnished to First Army casualties a medical service that was exceptional in efficiency, as shown by the low mortality rate attained. By his keen professional ability and tireless devotion to duty he contributed directly to the saving of thousands of lives and to the combat effectiveness of the First Army." Dr. Rogers graduated from Tufts College Medical School, Boston, in 1914 and has been in the service since Dec. 8, 1917.

Captain Joseph J. Healy Jr.

Capt. Joseph J. Healy Jr., formerly of Brooklyn, flight surgeon with the 417th Bomb Group "Sky Lancers," an attack bomber unit of the Fifth Air Force in the Philippines, was recently commended for aiding in the rescue of two survivors of an airplane crash. While the Sky Lancers were stationed in New Guinea, one of their A-20 Havoc bombers made a crash landing in the jungles of the interior. Captain Healy volunteered to participate in the ground rescue of the two surviving members of the crew. He and his party made their way inland to within 2 miles of the location of the crashed plane by traveling up a tropical river in a launch, after which they proceeded overland to reach the plane, which was in the middle of a sage swamp. Even with the help of numerous natives, it took two days to reach the survivors, for there were almost insurmountable barriers of waist deep swamp, a thick overgrowth of sage palms 15 to 20 feet in height, almost impenetrable undergrowth, tropical downpours, and swarms of mosquitoes. Dr. Healy graduated from the Long Island College of Medicine, Brooklyn, in 1940 and entered the service Aug. 18, 1942.

Captain John F. Schlechter

The Soldier's Medal was recently awarded to Capt. John F. Schlechter, formerly of Brooklyn. Accompanying the award was the citation "for heroism at St. Dizier, France, on Dec. 22, 1944. An A-20 aircraft skidded head on into a parked P-47 aircraft loaded with Napalm bombs, which were torn loose and lay open and exposed around the wreckage in constant danger of exploding. On noticing the navigator imprisoned and seriously injured in the nose of his ship, Captain Schlechter, heedless of his own safety, rushed in, freed the navigator, carried him to safety and administered medical attention. Captain Schlechter's intense desire to render aid, no matter at what the cost or odds to himself, reflects credit on himself and is in keeping with the highest traditions of Army Air Forces." Dr. Schlechter graduated from the New York Medical College, Flower and Fifth Avenue Hospitals, New York, in 1941 and entered the service Aug. 20, 1942.

Captain Morton H. Rose

Capt. Morton H. Rose, formerly of Washington, D. C., was recently awarded the Bronze Star "for heroic achievement in connection with military operations against the enemy on April 13, 1945 in Germany." Dr. Rose graduated from George Washington University School of Medicine, Washington, D. C., in 1942 and entered the service on March 13, 1943.

Major Pasquale P. Franzese

Major Pasquale P. Franzese, formerly of Brooklyn, was recently awarded both the Bronze Star and the Unit Citation for meritorious service against the enemy at Kiriwina, Trobriands; Cape Gloucester and Talasea, New Britain; Aitape, British New Guinea, and Wakde-Toem, Dutch New Guinea. With complete disregard for his own safety he supervised the evacuation of casualties from areas under enemy fire, thus accomplishing rapid and life-saving hospitalization of these casualties. Major Franzese served as commanding officer of medical units that saw eighteen months' continuous service in combat areas. He graduated from Long Island College of Medicine, Brooklyn, in 1939 and entered the service Feb. 21, 1941.

Captain J. H. Gosman

The Legion of Merit was recently awarded to Capt. J. H. Gosman, flight surgeon, formerly of Indianapolis, for the development of an electrical headset for the treatment of ear trouble among combat fliers. This headset has shortened the period of treatment from three to five days. He was also cited for his work in the fields of sanitation and immunization. Dr. Gosman graduated from Indiana University School of Medicine, Indianapolis, in 1938 and entered the service March 27 1941.

Captain John S. Morawski

The Bronze and Silver stars were recently awarded to Capt. John S. Morawski, formerly of Brooklyn. The Bronze Star was awarded for heroism during a ten day period in September 1944 when his battalion was under constant artillery and mortar fire. Unmindful of personal risk, Captain Morawski went to the rescue of wounded personnel despite shells falling in their vicinity. The Silver Star was awarded for gallantry in action when Captain Morawski climbed into a disabled tank and supervised the evacuation of the wounded. One soldier was badly in need of plasma, which was successfully administered by the captain despite the shell fire about him. Dr. Morawski graduated from the Long Island College of Medicine, Brooklyn, in 1942 and entered the service July 16, 1943.

Captain Edmund R. Kinne

The Bronze Star was recently awarded to Capt. Edmund R. Kinne, formerly of Middletown, N. Y., "for heroic achievement in Germany, February 9. During the assault for the initial bridgehead across the Sauer River into the Sigfried Line, Captain Kinne of the Medical Department and two enlisted men volunteered to establish an advance aid station to care for the wounded. Crossing the river in a boat they worked continuously for thirty-six hours despite heavy shell fire to sustain life in the wounded until they could be ferried across the river. While performing these duties Captain Kinne was wounded by shell fragments. Dr. Kinne graduated from the College of Medical Evangelists in 1944 and entered the service in January 1944.

Major Edgar A. Lawrence

The Air Medal was recently awarded to Major Edgar A. Lawrence, formerly of New York. According to the citation "The Air Medal is hereby awarded for meritorious achievement while participating in more than one hundred hours of combat aerial flight over territory in Burma and China where exposure to enemy ground and air fire was probable and expected. This display of devotion to duty and a degree of efficiency above and beyond that usually expected reflects credit on this officer and on the Army Air Forces of the United States." Dr. Lawrence graduated from Johns Hopkins University School of Medicine, Baltimore, in 1933 and entered the service June 1, 1942.

NAVY

NAVY AWARDS AND COMMENDATIONS

Commander Charles W. Letcher

The Silver Star was recently awarded to Commander Charles W. Letcher, formerly of Wilkes-Barre, Pa., for "distinguishing himself conspicuously by gallantry and intrepidity while serving as medical officer on board an aircraft carrier. His vessel was directly engaged in supporting the landing of troops in the Southwest Pacific Area, when enemy air attack caused serious battle damage to the ship. An enemy plane and bomb hit and damaged sick bay, necessitated its evacuation and seriously wounded many of the personnel. Although he was painfully wounded, he disregarded his own injury and efficiently directed the orderly evacuation. With untiring devotion to duty, he continued to direct the entire process of caring for the casualties. His own skilful medical and surgical administration unquestionably saved the lives of a number of seriously wounded and contributed to the quick recovery of many others. By his knowledge of his profession, his leadership and courage he set an inspiring example which was in keeping with the highest traditions. . . ." Dr. Letcher graduated from Jefferson Medical College of Philadelphia in 1930 and entered the service in January 1940.

Lieutenant Commander Roy Randolph Powell

The Navy and Marine Corps Medal was recently awarded to Lieut. Comdr. Roy Randolph Powell, formerly of White Plains, Va. The citation accompanying the award read "for distinguishing himself by heroism while serving as senior medical officer aboard an aircraft carrier during the action of Nov. 25, 1944. Lieut. Comdr. Powell, with flight deck fires above him and hangar deck fires below him, heroically, with disregard for his own personal safety and unselfish devotion to duty, continued to treat casualties in the main battle dressing station, menaced by fire and suffocation, until all casualties were treated and safely removed to sick bay. His fearlessness, courage, utter disregard of his own safety and devotion to duty were at all times in keeping with the highest traditions of the United States Naval Service." Dr. Powell graduated from the University of Virginia Department of Medicine, Charlottesville, in 1935 and entered the service Jan. 16, 1937.

Lieutenant Commander Frank A. Patti

The Legion of Merit was recently awarded to Lieut. Comdr. Frank A. Patti, formerly of Leonia, N. J., "for distinguishing himself by exceptional meritorious conduct in performance of outstanding services in operations against the enemy in the battle of Leyte." Lieutenant Commander Patti is chief medical officer on the U. S. S. *Santee*. He graduated from the Long Island College of Medicine, Brooklyn, in 1931 and entered the service May 2, 1942.

Lieutenant L. Vincent Strully

Lieut. L. Vincent Strully, formerly of New York, received a commendation for outstanding devotion to duty and meritorious service in preparation for the invasion of France. "His performance was in accordance with the highest traditions of and reflects great credit on the U. S. Naval Service." Dr. Strully graduated from the Long Island College of Medicine, Brooklyn, in 1938 and entered the service July 1, 1943.

Lieutenant Glen G. Rice

The Silver Star was recently awarded to Lieut. Glen G. Rice, formerly of Seattle. Dr. Rice graduated from the University of Oregon Medical School in 1942 and entered the service July 10, 1943. He also shares in a presidential unit citation and was the recipient of the Purple Heart.

MISCELLANEOUS

QUININE BEING RELEASED FOR CIVILIAN MEDICINAL PURPOSES

The War Production Board recently announced that a limited amount of quinine is being released from the government stockpile for civilian antimalarial and other essential medicinal needs. Allocations of quinine, including the newly released quantities, will be made by WPB in accordance with the provisions of order M-131, governing cinchona bark and cinchona alkaloids. Wholesalers, distributors and processors are required to file form WPB-2945, stating the medicinal dosage form in which the quinine will be sold.

Authorization at the present time will be limited to use of quinine for filling physicians' prescriptions and for the manufacture of capsules. Physicians and patients who require quinine medication should purchase their supplies from local druggists or other sources of bulk quinine for prescription use as well as pills or tablets.

Because of an improved supply, totaquine may now be used for all medicinal and other purposes, WPB stated. Formerly totaquine, which represents the total alkaloids of cinchona bark, was authorized for antimalarial use only.

UNRRA COMMISSION ON QUARANTINE HOLDS MEETINGS

A series of meetings was recently held at UNRRA headquarters of its expert Commission on Quarantine for the purpose of making recommendations in regard to the control of yellow fever. One of the main problems discussed was the further delineation of endemic yellow fever areas in Africa and the Western Hemisphere. The recommendations of the Quarantine Commission will be acted on by the Standing Technical Committee on Health at a meeting in Washington early this fall. The control of yellow fever, including the delineation of endemic yellow fever areas and the laying down of standards for the manufacture of yellow fever vaccine, is a responsibility placed on UNRRA by the International Sanitary Convention for Aerial Navigation of 1944. Dr. G. H. de Paula Souza of Brazil, chief of the Epidemic Control Section of UNRRA's Health Division, is secretary to the commission.

DENTAL AND MEDICAL LITERATURE NEEDED

The Medical and Surgical Relief Committee of America (420 Lexington Avenue, New York 17) has received several requests from organizations operating in France and Italy for dental and medical literature of any nature—magazines, pamphlets or books—written within the last five years. News of scientific progress made since 1940 has been inaccessible to European professional men, and in the interests of science, health and good will it is hoped that all those who can spare any such medical material will send it to the Medical and Surgical Relief Committee headquarters.

The following eight textbooks have been requested for the use of the Medical Nutrition Mission in Italy:

Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases, seventh edition (R. P. Strong).
Manual of Clinical Mycology (Martin Conant et al.).
Pediatric Dietetics, 1937 (Saxl).
Brennermann's Loose Leaf Pediatrics, four volumes (Nelson).
Physiological Basis of Medical Practice (Best and Taylor).
Clinical Nutrition and Dietotherapy (McLester).
Oral Diagnosis (Miller).
Quantitative Clinical Chemistry, two volumes (Peters and Van Slyke).

AGE OF DENTAL OFFICERS

In the table entitled "Criteria for Separation" on page 1106 of THE JOURNAL of August 11 it was stated that the age of dental corps officers eligible for separation was 45 or over. This should have read 50 years or over.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

Aug. 27, 1945.

Scientific Developments to Be Completed

Scientific developments under way when Japan surrendered will be completed, according to Dr. Vannevar Bush, chairman of the Office of Scientific Research and Development and one of the leaders in creation of the atomic bomb. Following a conference with President Truman, he disclosed that the Office of Scientific Research and Development will be liquidated in the course of time. The wartime agency was operating "full blast" when Japan quit, and it cannot be eliminated over night, he said. It is one of the smallest agencies. "It just doesn't make sense," Dr. Bush stated, "to conduct research for three years and then drop it in fifteen minutes." The Office of Scientific Research and Development has many contracts with universities and commercial firms and laboratories still in force. Much of the work now being done is being completed against its need for defense or peacetime use. The peak of personnel of the Office of Scientific Research and Development was a little over seven hundred workers, half of whom were volunteers.

Veterans' Mental Health Hazards Stressed by Colonel Menninger

Col. William C. Menninger, chief of the War Department Psychiatric Division, warns that if the 300,000 veterans discharged for neuropsychiatric reasons are unable to find jobs they may become "confirmed invalids." He also stated that 1,825,000 men rejected by the Army because of "personality disorders" will be thrown toward "mental ill health" if confronted with unemployment. Colonel Menninger informed the Senate Banking Committee that psychoneurosis is the basis for 43 per cent of Army medical discharges and that another 130,000 were released because of inadaptability or ineptness; 39 per cent of the 5,650,000 men rejected by the Army, or 1,825,000 men, were turned down "because they were suffering from some type of personality disorder." In his testimony on the Senate study of jobs-for-all legislation to enable the government to plan against depressions and unemployment, Colonel Menniger said that most of the Army's psychiatric casualties were "children of the depression" who grew up when there were 8,000,000 unemployed.

General Bradley Gets First Hand Medical Information

Gen. Omar Bradley, veterans' administrator, recently sent a medical staff composed of reserve officers to tour the country for first hand information on veterans' medical facilities. This was revealed during a meeting here with representatives of the American Legion, Disabled American Veterans and Veterans of Foreign Wars. General Bradley also disclosed that he is attempting to use 100 beds each in Walter Reed and the Bethesda Naval Medical hospitals to combat overcrowded conditions in Mount Alto Hospital and is moving the crowded District of Columbia regional office nearer to his office to save veterans from "shuttling back and forth" attending to their affairs. Veteran groups regard all three disclosures as indicative of good treatment from the new administrator.

Federally Financed Lanham Act Projects Cut Down

Federal Works Agency regional officials throughout the country have been instructed to review the need for continuance of aid to wartime facilities after October 31. However, $8,000,000 in Lanham act construction, which includes the new Georgetown and George Washington hospitals, will "very likely" not be affected by liquidation of aid to war centers. Under the Lanham act, cities with populations increased by an influx of war workers received federal assistance toward maintenance and building of child care centers and hospitals and for provision of municipal services, recreation and health programs. In Washington some forty-eight nursery schools and child care centers having an enrolment of 700 children will be affected. Major Gen. Philip B. Fleming, head of the Federal Works Administration, said that all federally financed Lanham act projects on which construction has not yet begun will be suspended immediately and allotments rescinded. Projects under construction may continue either to completion or to completion of a useful unit of the project if need for the project can still be shown to exist.

Slight Increase in Number of Women Medical Students

Despite desperate need for civilian doctors during the war, there has been only a slight increase in the number of women doctors. According to a report of the Women's Bureau of the Department of Labor there were 1,146 women students in approved medical schools in 1943 and 1,176 in 1944. The report gives these reasons: "Length of the training program for medicine as compared with other professions is of itself a deterrent to many women, since it not only increases the total cost to the student but also postpones the date she can begin to earn. . . . Since the war, tuition fees for medical schools have increased; in 1943 they were $409, compared with $378 in 1940."

Warning of Dangers in the Use of DDT

The similarity of DDT to flour was cited by medical authorities in warning consumers of dangers in having it stored in the household. Since the surrender of Japan the insecticide, developed during the war and restricted to army use to keep down disease in battle areas, has been more and more in the news with the prospect of its release for general civilian use. Already chemical firms are planning its distribution on a large scale. Washington authorities are also watching with interest the experiment at Rockford, Ill., where 1,100 gallons of DDT was spread over the community to control an outbreak of infantile paralysis.

Army Research on Artificial Limbs

Brig. Gen. Eugene A. Regnier, former cavalry officer, regarded as a topnotch administrator, has been appointed by Gen. Brehon Somervell to head the Army Service Forces Research and Development Division. General Somervell has ordered Regnier to make development of better artificial arms and legs his top priority job and to speed work of medical research officers, "whose efforts thus far in this field have been inadequate." General Regnier will try to translate Somervell's orders into something tangible for servicemen who have been disappointed with artificial limbs supplied by the Army.

Construction of Four Hospitals Approved by President

Veterans Administration announces that President Truman has approved construction of four hospitals: (1) an 1,800 bed neuropsychiatric hospital on a 713 acre site at Camp Reynolds, Greenville, Pa.; (2) a 300 bed general medical and surgical hospital at Seattle on a 44½ acre Beacon Hill site given by the city; (3) a 250 bed general medical and surgical hospital at Fresno, Calif., on a 20 acre site given by the city; (4) a 250 bed general medical and surgical hospital at Iron Mountain, Mich., on a 30 acre plot known as the von Platten-Fox site.

Proposed Creation of U. S. Public Welfare Department

Administration leaders have drafted plans for creation of a new department of government, the Department of Public Welfare. As outlined, it would include the Federal Security Agency, the Public Health Service, the Children's Bureau of the Labor

Department and possibly others. It would be headed by a new cabinet officer. If created, it would be the first new department established since the Department of Labor was set up thirty-two years ago.

Mothers Protest Closing of Child Care Centers

Since the announcement that withdrawal of Lanham act funds will result in closing of fourteen of twenty-two child's care centers in the District of Columbia, worried mothers in a meeting have demanded an extension of federal funds for the centers.

Penicillin Released From War Controls

The War Production Board announces that penicillin has been removed from all restrictions as to use and allocation, effective August 31.

Council on Medical Service and Public Relations

PREPAID MEDICAL CARE NEWS

Group Health Doctors' Plan Speeds up Enrolment

The board of directors of Group Health Cooperative in New York City, which operates a plan of insurance against doctors' bills, announced at its meeting June 27 that since Visiting Nurse Service was added to the plan's benefits on June 1 there has been the most rapid increase in enrolment in its history.

"More than 3,500 new subscribers have been secured during the month of June so far," Mr. Charles Marlies, president of Group Health, said. "In every case, employers are paying either a large share or all of the premiums for their employees. In several instances the Group Health Plan is a part of agreements with trade unions. Corporations which have taken the plan are in a wide variety of industries.

"This increasing interest on the part of employers," Mr. Marlies pointed out, "shows a growing recognition of the value of insurance against the costs of medical care as an essential element in employee welfare programs. Progressive management sees the need of average families to put medical expenses on a budgetable basis."

Eighteen Million Covered by Blue Cross Plans

More than a campaign promise or a majority vote is required to furnish adequate hospital and medical care to every one in America, C. Rufus Rorem, Ph.D., director of the American Hospital Association's hospital service plan commission, Chicago, declared in Philadelphia on June 14 during an address at a Regional Conference of fourteen Blue Cross plans.

Mr. Rorem made his statement in reference to the newly introduced Murray-Wagner-Dingell bill, now before the United States Congress, which proposes (among other phases of social security) a federal plan of compulsory health insurance, and to similar bills now before some state legislatures.

The commission, which Mr. Rorem directs, is the national coordinating agency for eighty-four nonprofit Blue Cross health service prepayment plans with a voluntary membership of 18,000,000 persons in forty-three states, seven Canadian provinces and Puerto Rico.

For more than twelve years, Mr. Rorem said, the American Hospital Association has recognized the value of the insurance principle for lightening the financial burdens of patients and stabilizing the income of hospitals. "What the federal bill proposes," he stated, as far as its health provisions relate to the employed population and members of their families, "the Blue Cross plans are achieving and have for the past ten years. The Blue Cross movement has not been crystallized into a final pattern," the director of the commission emphasized. "Executives and trustees of these nonprofit community organizations recognize that their success in reaching 18,000,000 Americans is a challenge to extend the protection to every employed person and family dependent throughout America."

Bureau of Information

SUMMARY SHEETS FROM WASHINGTON

Completed county summary sheets have been received from counties in Washington through Dr. A. J. Bowles, secretary, Washington State Medical Association.

The accompanying table gives data from selected counties in this state. The column giving the number of persons per telephone is used as one index of the economic status of the area. Many physicians over 65 years of age are carrying on large practices and are doing much to maintain the health of communities. They are not included in computing physician population ratios, however, as the future needs of the communities will be largely dependent on younger physicians.

A current knowledge of needs of communities for doctors is essential if adequate help is to be given veteran medical officers in their problems of medical practice. These needs can be indicated on the summary sheets under "Remarks" by the state and county secretaries and are then available to inquiring medical officers. Frequent reports from state and county medical societies about needs of communities for doctors will help maintain current files and will increase the service of the Bureau.

Washington

County [1]	Principal Cities [2]	Population	Physicians Under 65	Persons per Physician	Persons per Telephone [3]
Asotin		**8,558**	1	6,558	32
	Clarkston	3,116			
Douglas		**5,925**	2	2,963	13
Grant		**6,835**	5	1,367	8
	Grand Coulee	3,659			
Grays Harbor		**45,873**	19	2,414	9
	Aberdeen	18,846			
	Hoquiam	10,835			
Lincoln		**9,242**	5	1,848	5
Mason		**11,970**	3	3,990	18
	Shelton	3,707			
Pend Oreille		**5,477**	4	1,369	27
Skagit		**36,091**	14	2,578	8
	Anacortes	5,875			
	Mt. Vernon	4,278			
	Sedro Wooley	2,954			
Wahkiakum		**3,159**	1	3,159	11
Yakima		**96,725**	38	2,545	12
	Yakima	27,221			
	Toppenish	3,683			

1. Bureau of Census, estimated population 1943.
2. Bureau of Census, population 1940.
3. Based on 1940 figures, American Telephone and Telegraph Company.

With the information available on a completely filled out summary sheet, it is readily possible for an interested medical officer to make an initial selection of areas in which he might like to practice. Since vacancies are held open in many communities for doctors now in military service, further investigation by direct correspondence with state and county medical societies will always be necessary to insure an accurate report of the needs of individual communities.

FOUR STATES NOT YET REPORTED

In recent weeks, many requests have been made by veteran physicians for help with their problems of returning to civilian practice. Where information about the medical and economic factors of counties is lacking, it is impossible to give these men the help they need. Those states and counties which have not returned completed county summary sheets are urged to do so as quickly as possible so that the Bureau of Information can more fully accomplish its aims of giving adequate help to physicians returning from service with the armed forces.

County summary sheets have not yet been received from four states. Those states from which no returns have been received include Delaware, Oregon, Rhode Island and Vermont.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Changes in Health Officers. — Dr. Elmus K. Hanby, Attalla, has resigned as acting health officer for Etowah County, effective August 1, to devote more time to private practice (THE JOURNAL, July 21, p. 891).

Cancer Clinic.—The Alabama Division of the Field Army, American Cancer Society, recently opened its second industrial cancer clinic at Talladega. The first is at Avondale Mills, Sylacauga. The new clinic was made possible through the Bemis Brothers Bag Company, Talladega, and members of the Talladega County Medical Society are cooperating in examining the patients. Men and women are examined at the clinic.

Concentrated Attack on Venereal Disease. — Of the more than 260,000 persons in Jefferson County examined for venereal infections in a recent six week period more than 3,000 were found to have early syphilis. The total examined represents 90 per cent of the population of the county, which is the ninth in the state to launch a concentrated examination campaign authorized by the 1943 legislature when it passed a law requiring all persons in the state between the ages of 14 and 50 to have a blood examination. Those found with syphilis are to get treatment either from a physician or free through the state department of health. The U. S. Public Health Service, the state department of health and the county and city health departments of the state are cooperating in the survey, which is broadened in the attempt to uncover also venereal diseases other than syphilis. According to the *Southern Medical Journal,* reports in the medical literature suggest an estimate that one person in every ten in Alabama has syphilis.

DISTRICT OF COLUMBIA

Frederick Gillick Resigns.—Dr. Frederick G. Gillick has resigned as chief of the bureau of venereal disease in the district health department to resume work with the U. S. Public Health Service, according to the Washington *Star.* Dr. Gillick has been connected with the department since 1943.

Tuberculosis Association Creates Bureau of Information. — The District of Columbia Tuberculosis Association, through its recently developed bureau of information, offers information in relation to health and community services in the control of tuberculosis in the District of Columbia; assistance in how best to use all available diagnostic facilities, such as x-ray equipment and sputum examinations; literature on tuberculosis; diagnostic standards; x-ray interpretations; booklets and pamphlets on family health education for office distribution to patients, and health education for patients and families on referral. Rebecca Sweeney, R.N., is secretary of the bureau of information, 1601 18th Street N.W.

ILLINOIS

Changes in Health Officers. — Dr. Samuel N. Mallison has resigned as superintendent of health of Decatur, effective August 1, to join the state department of health as district No. 6 health officer with headquarters in Champaign. He will be in charge of the district including Livingston, Kankakee, Ford, Iroquois and Vermilion counties.

Committee Named for Hospital Study.—Dr. Henrietta M. Herbolsheimer, acting chief of the division of maternal and child hygiene, state department of health, Springfield, has been named secretary of an executive committee to conduct a survey of Illinois hospital facilities. Newspapers report that the group will operate under authority of an advisory council appointed by Governor Green to determine hospital needs throughout the state.

Chicago

Personal.—Alden B. Mills, managing editor since 1933 of the *Modern Hospital,* has resigned to become superintendent of the Collis P. and Howard Huntington Memorial Hospital, Pasadena, Calif.; he will take up his new work October 15.

School for Medical Librarians.—The Wesley Memorial Hospital announces the opening of a School for Medical Records Librarians, the first class to begin September 25 and the second February 12. The new school, conducted as a subdivision of the program in hospital administration at Northwestern University, makes it possible to grant university credit totaling twenty-four semester hours to students who successfully complete the courses. Edna K. Huffman, R.R.L., chief medical records librarian, Wesley Memorial Hospital, has been named director of the school, which is being sponsored by the hospital administration division, School of Commerce, Northwestern University. Additional information may be obtained from Mrs. Huffman at Wesley Memorial Hospital, 250 East Superior Street, Chicago 11.

MASSACHUSETTS

New Director of Mental Hygiene. — Dr. William C. Inman, Danvers, has been appointed director of the division of mental hygiene and research of the Massachusetts State Department of Mental Health. Dr. Inman succeeds Dr. Edgar C. Yerbury, who resigned to become superintendent of the Connecticut State Hospital, Middletown, Conn. (THE JOURNAL, July 22, 1944, p. 858). Dr. Inman graduated at Tufts College Medical School in 1924. For the past few years he has been assistant superintendent of the Danvers State Hospital, according to the *Bulletin* of the Massachusetts Society for Mental Hygiene.

MICHIGAN

Fellowships in Psychiatry.—Dr. Albert C. Furstenberg, dean, University of Michigan Medical School, Ann Arbor, announces that there are ten one year fellowships in psychiatry now available at the university. These fellowships, which offer an annual stipend of $2,000 and which are under the sponsorship of the Office of Veteran's Affairs of the State of Michigan, include training at the Neuropsychiatric Institute of the university. Candidates must be graduates of an approved medical school and must complete a rotating internship before beginning their fellowship. Applications should be made to Dr. Raymond W. Waggoner, professor of psychiatry, University Hospital, Ann Arbor.

Health Officers' Committee Named to Advise State Commissioner.—A five member committee from the Michigan Health Officers Association has been appointed to serve in an advisory capacity to the state commissioner of health. Members of the committee, who will meet once a month with Dr. William DeKleine, state health commissioner, to discuss problems and exchange ideas, are Drs. Hugh B. Robins, Marshall, Calhoun County; Bruce H. Douglas, Detroit; Richard Sears, Marquette; Leslie V. Burkett, Flint, Genesee County, and Albert E. Heustis Jr., Coldwater, Branch County. Dr. Clarence D. Barrett, Mason, health officer of Ingham County and president of the state health officers' association, is an ex officio member of the committee.

NEBRASKA

New Health Director of Lincoln.—Dr. Leroy L. Fatherree, since 1939 health officer of Little Rock, Ark., has been named director of the board of health of Lincoln, effective July 14. Dr. Fatherree graduated at the University of Tennessee College of Medicine, Memphis, in 1936.

Special Society Election.—Dr. John F. Gardiner, assistant professor of medicine, Creighton University School of Medicine, Omaha, was elected president of the Nebraska Tuberculosis Association at its annual meeting June 12. Other officers include Dr. Charles W. Way, Wahoo, and O. W. Ortlund, Omaha, vice presidents, and Clark S. Haas and Fred W. Conrey, Omaha, reelected secretary and treasurer, respectively.

Institutes on Tuberculosis.—Two one day institutes on tuberculosis were held at the Nebraska Hospital for the Tuberculous, Kearney and Omaha, August 6 and 8 respectively, according to *Better Health,* the bulletin of the state department of health. Among the speakers were:

Dr. Charles W. Rudolph, medical director, Hospital for the Tuberculous, Kearney.

Dr. Max Fleishman, medical director, tuberculosis service, Douglas County Hospital, Omaha.

Dr. Theodore F. Hilbish, tuberculosis consultant, U. S. Public Health Service, district 7, Kansas City, Mo.

Dr. Claude A. Selby, director of health, Nebraska State Department of Health, Lincoln.

Dr. Llewellyn E. Kling, Bellevue, director, state division of tuberculosis control.

Miss Margaret Taylor, R.N., public health nurse consultant, division of tuberculosis, U. S. Public Health Service, Washington, D. C.

Miss Lily C. Hagerman, R.N., public health nurse consultant, U. S. Public Health Service, district 7, Kansas City.

NEVADA

Dr. Caples Resigns. — Dr. Byron H. Caples, Reno, has resigned as director of the division of venereal disease control of the Nevada State Department of Health, effective June 30. Dr. Caples had held the position since 1937.

NEW YORK

Fund Named for Physician.—The will of Mrs. Charles E. Townsend bequeathed her residuary estate to St. Luke's Hospital, Newburgh, with the stipulation that it be known as the Dr. Charles E. Townsend Fund. It is estimated that the bequest will amount to approximately $500,000. Dr. Townsend was president of the board of managers, consulting surgeon and at one time chief surgeon and chief of the hospital staff at St. Luke's. He died March 16, 1942.

Physician Membership Increased on Medical Care Commission.—On June 30 Governor Dewey appointed Drs. Harold F. R. Brown, Buffalo, and Andrew A. Eggston, Mount Vernon, as members of the New York State Temporary Commission on Medical Care, increasing the physician membership on the commission from four to six. The commission was created by the 1944 state legislature to make studies, surveys and investigations for medical care and to prepare recommendations for the legislature. The original membership of the commission included four doctors of medicine, but action of the recent legislature increased the membership to six.

Cancer Teaching Day.—On September 18 a cancer teaching day will be held at the Middletown State Homeopathic Hospital, Middletown, under the auspices of the Medical Society of the County of Orange, Tumor Clinic Association of the State of New York, the state medical society and the division of cancer control of the state department of health. Speakers will include:

Dr. Earl D. Osborne, Buffalo, Cancer of the Skin and Allied Tumors.
Dr. Arthur J. Wallingford, Albany, Cancer of the Uterus and Vagina.
Dr. Hayes Martin, New York, Diagnosis and Curability of Intraoral Cancer.
Dr. Cushman D. Haagensen, New York, Cancer of the Breast.
Dr. George E. Binkley, New York, Cancer of the Colon and Rectum.

Mental Clinics for the Public.—The Westchester County Health Department was authorized August 6 by the board of supervisors to operate clinics for the mental care of persons who cannot afford private psychiatrists and psychologists. Credit is ascribed to the Westchester Mental Hygiene Association for launching the campaign to hold these clinics, which for the time will be known as "health clinics" and serve all residents. The supervisors appropriated $15,000 for starting the first clinic, more funds to be made available as needed. It is expected that five or six clinics will be operating in various parts of the county by next year, costing annually an estimated $75,000. For the present a psychiatrist, a psychologist and two social workers will start work in White Plains and sit occasionally in Mount Vernon. The communities of Westchester that are not in the county health district will be served on request.

Rehabilitation of the Blind.—A newly created rehabilitation division in the New York State Department of Social Welfare will administer a program to assist the blind set up under the federal vocational rehabilitation act. The program provides for rehabilitation of all blind persons over 14 years of age who need physical restoration, vocational training or job placement to fit them for self-supporting employment. The program will include medical, surgical, neurologic and related services; vocational training, including academic, technical and other courses; job placement and supervision of employment until the blind person becomes self sufficient, and studies and research. A general advisory committee will be appointed by Robert T. Lansdale, state social welfare commissioner, to advise the new division on general policies and standards and to assist in interpreting the program to the public. It will consist of representatives of management, labor, the medical profession, and public and professional and civic organizations identified with vocational rehabilitation of the handicapped. An advisory medical committee will also be set up, representing all specialized branches of medicine, public health nursing, hospital administration and social work. Among its members will be an ophthalmologist from the medical and advisory committee of the state commission for the blind, a member from the medical division of the social welfare department and a member of the general advisory committee, who will be the chairman. The medical committee will work cooperatively with the general advisory committee.

New York City

University News.—Dr. Louis Hausman has been appointed clinical professor of neuropsychiatry at the New York University College of Medicine, effective September 1, and Dr. Charles W. Depping assistant clinical professor of otorhinolaryngology. Dr. Renato Gazmuri, instructor of internal medicine, University of Chile, Santiago, has joined the department of physiology as a Rockefeller fellow. Ivan C. Hall, Ph.D., has resigned as professor of bacteriology and director of the department of bacteriology of the college.

Hospitals Merge.—Beekman Hospital and the Downtown Hospital are consolidating and will form a new institution to be known as the Beekman-Downtown Hospital, to be centrally located in the financial section of the city. It is planned to hold a public campaign for funds to erect a new building to hold about 200 beds and to be conducted later this year. The Beekman Hospital has a fund of $500,000 in escrow which will be used toward the cost of the new building. Beekman Hospital was founded in 1906 under the name of St. Gregory's Hospital. Downtown Hospital was established in 1916 under the name of Broad Street Hospital.

Mother's Aide Program.—The New York City Department of Welfare has inaugurated a new service to be known as the "Mother's Aide," which is designed to prevent unnecessary commitment of children to institutions when mothers are temporarily ill, either in a home or in a hospital, by providing care for them in their own homes. The city's budget provides for forty-five of these aides at annual salaries of $1,440 and for an administrative staff of five persons consisting of a supervisor and four investigators. It is expected that the program will not only alleviate the critical shortage of facilities for short term placement of children but avoid the psychologic shock to the child of institutionalization.

Warning on Typhoid.—The New York City Department of Health has issued an appeal to city residents who may have stopped at the Seacliff Hotel in Bradley Beach, N. J., recently to report to the department so that proper precautions may be taken to prevent a spread of typhoid which originated at the New Jersey hotel. Investigation by the New York City Health Department has revealed that 4 New York City vacationists developed typhoid and 14 additional New Yorkers are known to have been in the hotel on or after July 13, when exposure is presumed to have taken place. The New Jersey State Health Department, which traced the outbreak to a kitchen employee at the Bradley Beach resort, has already reported that there are 14 cases of typhoid among former hotel guests in addition to 4 cases discovered so far in New York City. The majority of patients became ill during the period July 23 to August 3. The city appeal was issued because the hotel register is said to be incomplete.

OHIO

New Dean of Pharmacy.—Arthur Paul Wyss, Ph.D., professor and head of the department of pharmacy at the University of Buffalo, Buffalo, N. Y., has been appointed dean of the School of Pharmacy at Western Reserve University, Cleveland. He succeeds Franklin J. Bacon, Ph.D., professor of botany and pharmacognosy, who accepted the temporary appointment last year when Edward D. Davy, B.S., resigned to become head of the division of pharmacy at the Winthrop Chemical Company, Rensselaer, N. Y.

Veterans Collateral Pool Fund.—The Columbus Academy of Medicine has established a Veterans' Collateral Pool Fund of $50,000 for "assisting, in a material yet uncompromising way, the returning veteran members of the Columbus Academy of Medicine who may need financial assistance in establishing or reestablishing themselves in the practice of medicine." The state medical journal points out that the Columbus plan is unique. Physicians were requested to purchase one or more 1.5 per cent U. S. Treasury Coupon Bonds, due in 1950, in the amount of $500 each and to agree that the bond be placed in a pool to be held for a period of five years if necessary. The pool is to be used in providing collateral for loans to be made by a Columbus bank, the pool to be under the supervision of the veterans' committee of the academy of medicine. The veterans' committee and the officials of the bank are to determine the necessity, reasonableness and amounts of all loans applied for.

Proposed State Health Center. — A proposal is before Governor Frank J. Lausche of Ohio and members of the legislature for the erection of a state health center at Ohio State University, Columbus, *Science* reports. An appropriation of five million dollars is requested to cover the cost of the center as the result of two years of planning and study by

members of the medical and dental faculties and by representatives of these professions. The proposed center has been approved by official representatives of the medical colleges of Western Reserve University, Cleveland, and the University of Cincinnati. It has also been approved by the Inter-University Council, which includes representatives of the six state universities, Bowling Green State College, Kent State University, Miami University, Oxford, Ohio University, Athens, and Ohio State and Wilberforce University. Joining also in active support of the project are medical, dental and nursing alumni of the Ohio State University under the chairmanship of Dr. Russel G. Means, Columbus.

TEXAS

Osteopaths Defeated in Injunction Proceedings Over EMIC Program.—The Third Court of Civil Appeals, Austin, recently denied to osteopaths an injunction to restrain the state board of health from carrying out the EMIC program until the program had been modified to permit osteopathic participation. The plan in operation in Texas at the time limited participation, as far as medical services other than obstetrics were concerned, to graduates of medical schools approved by the Council on Medical Education and Hospitals of the American Medical Association. As to pediatric services to newborn infants referred by obstetricians, the plan limited participation to specialists certified by the American Board of Pediatrics or physicians who have completed at least one year of graduate training in a pediatric residency approved by the Council on Medical Education and Hospitals. Such restrictions, the osteopaths claimed, wrongfully deny to them the right of participation. The court pointed out, however, that under the federal law authorizing the program a state board of health acts not as a state agency but as an agency of the federal government through which the funds for the program are to be expended, that the plan in operation in Texas was one outlined by the Children's Bureau and approved by it and that state courts have no jurisdiction over the United States or its agencies charged with the administration of the provisions of the appropriation act authorizing the expenditure of funds for the program. The court, therefore, denied the petition for the injunction.

ALASKA

Health Activities.—A survey of health conditions on Seward Peninsula, as well as northern parts of Alaska, is to be carried out for westward and interior Alaska. The disease control program will consist of case finding, diagnosis and rapid treatment, with administration of immunization, chest roentgenograms, education in nutrition and a venereal disease program. It is said that the health of the Eskimos demands particular attention. They will be included in this health survey. *Northwest Medicine* reports that an investigation was recently instituted in Alaska by leading Ketchikan physicians, together with the Territorial Health Department and local health workers, to find the cause of outbreaks of intestinal illness existing for several years in Ketchikan and that vicinity. Information will be sought from persons who are known to have suffered intestinal illness of unknown origin during past months. An intensive survey was contemplated to secure this information.

GENERAL

Examination in Otolaryngology Canceled.—The Chicago meeting of the American Board of Otolaryngology, scheduled to be held in October, has been canceled. The next examination will be conducted in the spring, the exact time and place to be announced later. Dr. Dean M. Lierle, University Hospital, Iowa City, is the secretary-treasurer of the board.

Markle Foundation Publishes Report.—The John and Mary R. Markle Foundation appropriated more than $500,000 in 1944 for all purposes, according to its annual report just made available. Appropriations included $323,564 for research in the medical and physical sciences, $79,645 for old age assistance and relief to individuals, $38,500 for special contributions and $78,375 for administrative and general expenses.

James Fieser Joins National Safety Council.—James L. Fieser has been appointed to the staff of the National Safety Council to develop a nationwide public service program in home, traffic, farm, school and public safety. Mr. Fieser, who for more than twenty-seven years has been with the American Red Cross, has resigned as vice chairman at large of the Red Cross and was to assume his new activities September 1 with headquarters in New York.

Wallace Graham Named Personal Physician to President Truman.—Lieut. Col. Wallace H. Graham, M. C., formerly of Kansas City, Mo., is to be personal physician to President Truman, according to the Associated Press, August 13. Colonel Graham is 34 years of age and the son of Dr. and Mrs. James W. Graham, Kansas City. He graduated at Creighton University School of Medicine, Omaha, in 1936 and subsequently studied at Harvard University and in Vienna.

Proposed Measures to Prevent Rise in Drug Addiction.—New international measures to prevent a postwar rise in drug addiction were recommended August 13 by the Bureau of Narcotics, U. S. Treasury, according to the New York *Times*. In a report for 1944 on the traffic in opium and other dangerous drugs, the bureau said that important stocks of drugs were being held in certain countries by traffickers who awaited a chance to ship them to the United States for distribution. Iran, India and Mexico were the chief sources of opium smuggled into the United States last year, it was stated. There was a sharp rise in opium seizures, especially at Atlantic ports and along the Mexican border. The largest single seizure made by U. S. customs officers in six years, despite restrictions on shipping, was 63 pounds of opium sent from India and taken from Baltimore.

Special Society Elections.—Dr. Custis Lee Hall, Washington, D. C., was chosen president-elect of the United States chapter of the International College of Surgeons at a recent meeting in New York and Dr. Herbert Acuff, Knoxville, Tenn., was installed as president. Other officers include Drs. John Royal Moore, Philadelphia, senior vice president; Drury Hinton, Drexel Hill, Pa., treasurer, and Louis J. Gariepy, Detroit. Dr. Max Thorek, 850 West Irving Park Road, Chicago 13, is the international general secretary of the International College of Surgeons.——At the annual meeting of the board of trustees of the American Registry of X-Ray Technicians in Chicago, June 17, Dr. Darmon A. Rhinehart, Little Rock, Ark., was elected president, Dr. Sidney J. Hawley, Danville, Pa., vice president and Dr. John M. Keichline, Huntington, Pa., secretary-treasurer. Mr. Alfred B. Greene, Oak Terrace, Minn., was reappointed executive secretary.

Plan to Accredit Schools of Public Health.—The Commonwealth Fund has made available funds to the American Public Health Association to "create a properly constituted accrediting body to carry forward progressively a list of universities qualified with regard to program, personnel and facilities, to offer adequate courses leading to degrees of master of public health, doctor of public health and the diploma in public health." Charles-Edward A. Winslow, Dr.P.H., New Haven, has been named counselor to be responsible for the investigative work. He will be aided by persons experienced in the administration of health departments, chosen from different localities for different schools. The present plan will be to examine schools for accreditation at their own request. First attention will be given to schools in the United States now offering the M.P.H. degree and in Canada offering a Diploma. Accreditation of field training stations and of courses for various public health specialties will not be attempted immediately, according to the *American Journal of Public Health*.

New Officers of Tuberculosis Groups.—Dr. Victor F. Cullen, State Sanatorium, Md., was recently chosen president-elect of the National Tuberculosis Association and Mr. Will Ross, Milwaukee, was installed as president. Other officers include Dr. Henry Stuart K. Willis, Northville, Mich., and Dr. Philip H. Pierson, San Francisco, vice presidents; Dr. Charles J. Hatfield, Philadelphia, secretary, and Livingston Platt, New York, treasurer. Dr. John Alexander, Ann Arbor, Mich., is the new president-elect of the American Trudeau Society, medical section of the National Tuberculosis Association, and Dr. Ezra R. Bridge, Rochester, N. Y., president. Drs. R. McLeod Riggins, New York, and Hugh B. Campbell, Norwich, Conn., are vice president and secretary-treasurer, respectively. Edward K. Funkhouser, Washington, D. C., executive secretary of the District of Columbia Tuberculosis Association, is the new president of the National Conference of Tuberculosis Secretaries. Other officers include Glenn V. Armstrong, executive secretary, Los Angeles County Tuberculosis and Health Association, vice president; Mrs. May M. Pynchon, Jacksonville, Fla., executive secretary, Florida Tuberculosis and Health Association, secretary, and Donald E. Pratt, executive secretary, Missouri Tuberculosis Association, treasurer.

Council of New England Medical Societies.—On July 18 the Council of New England State Medical Societies was organized at a meeting in Providence, R. I. All the New England states were represented by delegates with the exception of Maine, these delegates being unable to attend because of transportation difficulties. The objective of the new group is to bring about a closer cooperation between the state medical societies in New England in the development and maintenance of the highest standards in the conduct and administration of medical care, in the development of plans to improve the health of all the people in the New England states. It proposes to concern itself with the problems of the composing members, avowing the principle that it shall not constrain its members to relinquish any existing affiliation, nor shall it seek to supersede the control now exercised by the governing bodies of each respective state medical society, or by the House of Delegates of the American Medical Association. The council decided to hold an annual meeting on the third Wednesday of April. Temporary officers chosen include Drs. James R. Miller, Hartford, Conn., chairman of the council of the Connecticut State Medical Society, president; John F. Kenney, Pawtucket, R. I., president of the Rhode Island Medical Society, vice president, and Mr. John E. Farrell, executive secretary of the Rhode Island Medical Society, secretary-treasurer. The next meeting of the council will be held October 14.

Prevalence of Poliomyelits.—Reports of cases of poliomyelitis for the week ended August 18 have been received from the division of public health methods, U. S. Public Health Service, as follows:

Division and State	Poliomyelitis Week Ended 8/18, 1945	Poliomyelitis Week Ended 8/19, 1944
New England States:		
Maine	0	0
New Hampshire	1	6
Vermont	2	2
Massachusetts	22	30
Rhode Island	0	0
Connecticut	13	15
Middle Atlantic States:		
New York	110	469
New Jersey	72	24
Pennsylvania	50	108
East North Central States:		
Ohio	15	92
Indiana	16	23
Illinois	77	34
Michigan	10	55
Wisconsin	3	11
West North Central States:		
Minnesota	9	38
Iowa	7	12
Missouri	10	4
North Dakota	2	4
South Dakota	0	0
Nebraska	4	2
Kansas	1	7
South Atlantic States:		
Delaware	2	4
Maryland	8	27
Dist. of Columbia	12	19
Virginia	25	66
West Virginia	6	12
North Carolina	6	48
South Carolina	11	1
Georgia	3	5
Florida	3	8
East South Central States:		
Kentucky	1	35
Tennessee	36	5
Alabama	7	7
Mississippi	3	6
West South Central States:		
Arkansas	0	2
Louisiana	6	4
Oklahoma	18	6
Texas	55	4
Mountain States:		
Montana	0	2
Idaho	1	0
Wyoming	0	2
Colorado	7	3
New Mexico	0	0
Arizona	0	3
Utah	8	2
Nevada	1	0
Pacific States:		
Washington	22	12
Oregon	2	19
California	25	16
Total	692	1,254
First 33 weeks of Year	4,276	6,262
Median, 1940-1944	2,821	

LATIN AMERICA

Health Activities in Latin America.—*Inter-American Typhus Conference in Mexico.*—The public health and welfare department of Mexico is calling an Inter-American Typhus Conference to be held in Mexico City from October 7 to 13 under the sponsorship of the Institute of Inter-American Affairs and the Pan American Sanitary Bureau, to bring together leading workers in the typhus field in the American republics to discuss the latest developments, both in the field of research and in the practical control of the disease. As epidemic typhus is a serious problem in many of the American republics and as leaders of the typhus control program in the United States armed forces have experienced success in the control of this disease, it is believed that the calling of such a conference is opportune. Invitations to leading scientists are being issued, but other persons who have an interest in this subject will be welcome to attend the meeting. Correspondence should be directed to the Secretaría de Salubridad y Asistencia, Mexico, D. F.

Personal.—Col. Harold B. Gotaas, Sc.D., director of the division of health and sanitation of the Institute of Inter-American Affairs, has been decorated by the Chilean government with the Order of Merit. Before joining the army in 1942 Colonel Gotaas was professor of sanitary engineering in the University of North Carolina School of Public Health. ——Dr. Joaquin J. Vallarino, chief of the x-ray section of the Herrick Clinic in Panama, is the new Panamanian ambassador to the United States.——Dr. Jean F. Rogier, formerly medical officer with the Field Party in Brazil, left Washington, D. C., June 28 to become chief of the Field Party in Paraguay.

New Construction.—Work was started in July on a new dispensary in La Boca, Canal Zone, to provide more adequate health facilities for the silver workers in the area. Under present arrangements La Boca residents receive dispensary service in Balboa.

FOREIGN

"Pool" of Physicians Created.—A pool of young physicians has been set up by the labor government in New Zealand which, according to the New York *Times,* ties physicians to the health department for from three to five years after graduation and binds them to serve in the posts and locations chosen for them. The *Times* states that the ministry of health has achieved this objective by a simple variation in the terms of the scholarships granted to the national medical school at Dunedin. First plans for the scholarships, which are granted by the government, were that they should allow brains to be sufficient qualification to study medicine and abolish the barrier represented by the need of funds to begin seven years of study. Arthur Nordmeyer, health minister, has announced, it was said, that the academic merit alone is to be the test of whether scholarships are granted and the means test is abolished. There was considerable argument between the health department and the national medical association over the terms of the scholarships when these were first drafted. The medical men were dismayed at the way in which the government had tied down the students for the years following their graduation. On the arguments of the doctors the terms were said to have been varied. But now the minister of health has announced that if a medical student is graduated on a scholarship he must carry out his pledge to serve from three to five years where the government sends him or else repay the amount of his scholarship, plus interest, and plus a penalty to be determined by the minister. The amount of this fine apparently could be varied. The change had been made, the minister frankly admitted, because "some students had openly declared their intention of terminating their contract by repayment of the scholarship money. Thus every one of the sixty-seven students who have already accepted scholarship aid and every one who does so in the future becomes drafted to three to five years' state service unless able to pay a fine that is intended to be so large as to make it hard for him to escape. The government has made this move because it needs interns for public hospitals now staggering under the load that free medical care has laid on them, but chiefly because there is what Mr. Nordmeyer calls "great scope" in back country areas, where medical services are held inadequate. In some regions, particularly mining districts where physicians have been subjected to threats if they did not grant medical certificates, it has been hard to find doctors to serve now that free consultation has stepped up city business. The health department will not require that doctors stay in these regions for long periods, Mr. Nordmeyer says, and will provide houses and automobiles. Pay for these young draftees is not to be high. It will approximate $4,200 a year at prewar rates of exchange, no more than dock laborers have been receiving in wartime, and it will stop there unless the doctor obtains some further qualification or wins recognition as a specialist. But the winning of these qualifications is one of the strongest points of criticism of the new government plan. Strong criticism of the new move by the health minister came from the national medical association. "As originally understood, the object of the scholarships was that talent should not be impeded by lack of means," an official statement said. "It now appears that universal availability of the scholarships and the conditions attaching to them will create a pool of young doctors tied to the government and subject to direction to whatever work the government may determine. Would any trade union countenance such conditions? "Evidently a large number of scholarships is contemplated, and the capacity of the medical school is limited. Will there be room for students who prefer to pay their own way, or will these have to go elsewhere? Will they be allowed to do so?" The National Medical Council also found dangers in a new government plan to permit graduate doctors to begin private practice without first spending a year in hospital work.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 4, 1945.

The Socialist Government and the Medical Profession

It was pointed out previously (THE JOURNAL, Nov. 4, 1944, p. 651) that the proposed national health service, which has produced the greatest crisis ever faced by the medical profession, was only one of the manifestations of the socialistic trend of British politics. The profession has been so occupied with discussion of details that it does not seem to have given this consideration due weight. It has accepted socialistic legislation as inevitable, but its representatives in negotiation with the minister of health of the late government have endeavored to secure terms acceptable to the profession. That government was a coalition of all the political parties formed for the purpose of prosecuting the war. But in spite of a predominant conservative ingredient the coalition government agreed to schemes of socialistic legislation. The chief of these was the plan for a national health service, which has been described in previous letters. "We are all socialists in these days," said a great conservative statesman many years ago, and, as wary politicians, the conservatives have seen the need to accept some socialism in order to avoid the greater evil of the return to office of the socialistic party. But this policy has not now availed them. Notwithstanding the prestige of the greatest national leader ever produced by this country, to whom an unpayable debt is owed for his unique services in her hour of greatest peril, the conservative party has sustained a crushing defeat. An attempt to explain the causes of this defeat would take one outside the province of these letters. But it may be said that the socialistic trend mentioned was pent up during the need for union of all parties in the face of the German peril, and that now the flood is let loose. Also the country decided that if it was to have socialism this would come more effectually from professed socialists than from those who were only lukewarm.

The bearing of all this on the proposed national health service will be obvious. Before the election the representatives of the profession had long negotiations with Mr. Willink, minister of health, who is a conservative and a lawyer. The negotiations have not been published, but there are indications that Mr. Willink would have tried to meet the objections of the profession and make the national service as acceptable to the profession as possible. The socialist press charged him with "surrendering to the doctors," though he seems to have only endeavored to come to an agreement while preserving essentials. Now we have a socialist government in power, and the minister of health, Mr. Bevan, is a stalwart socialist. Hence the *British Medical Journal* says that it would have been an advantage if the bill for a national health service could have been presented to Parliament by the late coalition government, in which the political forces were more or less evenly balanced. Now that the Labor party is in power the results of prolonged and difficult negotiations may be found "in the discard." In a pamphlet on a "National Service for Health" this party has declared that "only a system of whole time salaried and pensionable doctoring will meet the requirements." Now this proposal would convert the medical profession into government officials, which has been declared by the representatives of the profession to be the most objectionable feature of the scheme for a national health service.

Hospital Reform

The government project for a complete national health service has led the Ministry of Health to make a hospital survey and ascertain what facilities exist, to assess their adequacy and suggest how they can be coordinated and expanded to provide a complete and efficient service. For this purpose England and Wales have been divided into ten areas, of which London and the surrounding area are one. A report on this area by Drs. A. H. M. Gray and Andrew Topping has been published. The inhabitants number 14 million. There are some 380 governing bodies of voluntary hospitals, 25 major hospital owning local authorities, 20 minor authorities with maternity homes and 130 isolation and smallpox hospitals also provided by local authorities. As a result, admission to municipal hospitals is often hampered by administrative boundaries, while the independence of the voluntary hospitals has caused dispersal and competition instead of concentration into efficient units. In 1938 the voluntary hospitals admitted 473,000 and the municipal hospitals 477,000. But the voluntary hospitals dealt with eight times as many outpatients as the municipal.

The report is critical of the large amount of surgery done in the small hospitals by general practitioners, which is a reflection of the poor distribution of consultants in the area. Further, the care of the chronic sick is far from satisfactory. In the area as a whole there is a gross deficiency of beds.

Gray and Topping condemn the general practitioner hospital as a surgical specialist center. Each such hospital, they said, should be attached to a district hospital staffed with specialists. The function of the local general practitioner hospital should be for medical cases not requiring elaborate investigation but not suitable for nursing at home, for minor operations (excluding removal of tonsils and adenoids), for normal maternity cases, for the few urgent emergencies and accidents which cannot be taken to a district hospital and for convalescents. Specialists should visit the local hospitals regularly and hold outpatient clinics there. The main district hospital should not exceed 1,000 beds or fall below 400. A third type of "the special center" is proposed to serve areas much wider than those of district hospitals. These would include special hospitals, such as fever, chest or orthopedic. The most urgent single improvement would be in the staffing of hospitals. To make the best use of the specialists available, decentralization from London is urged. Payment of the specialists should be adequate for breaking their ties with London.

PARIS

(From Our Regular Correspondent)

July 14, 1945.

Reform of Medical Education and Organization

Robert Debré presented to the Comité des médecins français an interesting report on the professional organization of medicine and medical education. Debré believes that it should be possible to adopt the most audacious modern innovations along with the traditions which contain excellent elements and to restore to medicine the noble character of a liberal profession, while at the same time creating a solid sanitary framework under the surveillance of the state or other collective bodies. Equality must be realized among the French as regards health matters. It is necessary to assure to all patients the privilege of a professional secret, within reasonable limits, and free choice of the physician, the moral and therapeutic value of which is considerable. The reforms are to be based on the following principles:

1. The practitioner must retain the privilege of serving. This was well expressed by Duhamel, who said "The practice of medicine rests on a moral ideology, which generally is referred to as conscience; conscience is individual. . . . To give up individualism under conditions prevailing in the world today would be an act of resignation for a clairvoyant spirit, or, more exactly, a suicide. Since medicine has for its mission the assisting of man in the essential acts of his life, such as birth, suffering and death, medicine must remain one of the redoubts of individualism in danger."

2. Each French family should have an independent practicing physician.

3. The hospital, the medical personnel of which will be fixed and on full time, must absorb the private organizations and clinics and put at the disposal of the whole population and under the supervision of the faculty of medicine the center for diagnosis and treatment.

4. The teaching body must devote itself completely to its task and must lead essentially a hospital and university life.

5. To the faculties of medicine will be entrusted the technical direction of hospital services, the regional supervision of hygiene, the contact with practitioners, the courses of postgraduate instruction, the direction of the profession toward a close participation in national propaganda for sanitation and the organization of preventive medicine.

However, in this liberty and in this initiative given to the medical profession, the state will have its part. The state will conduct the financing and will set in motion and will maintain the administrative features of all these organizations. The state will carry through the work of prevention, the starting point of which will be the family physician, because the family is the initial unit.

Experimentation on Man

Christian Charpy presented to the Académie de médecine authentic documents which fell into the hands of the French police in the course of the invasion of Germany and which establish irrefutable proof of experimentation on prisoners, performed not by the executioners but by German scientists. Histologic preparations of human testes and epididymides were found in the laboratory of Professor Hirth of Strasbourg. There were 54 preparations from 7 persons. Charpy produced reproductions of these preparations. They were not those of normal tissue. Some showed considerable edema with desquamation of the vascular walls, occasionally massive, at other times limited to the seminal epithelium, agglutination of seminal elements and homogenization of localized groups of interstitial cells. In other preparations edema appeared to be in the process of resorption, the congestion was less severe and a number of seminiferous tubules were reduced to a state of cellular uniformity; in others the spermatogenesis was arrested, while still others were represented by a cicatrix. The lesions were not generalized or homogeneous as, for example, after irradiation, in alimentary disturbances or in general intoxication. They were limited and appeared as spindles throughout the gland or through one lobe, the rest of the gland being little or not at all involved. Such lesions are produced when intraparenchymatous injections with toxic or irritating substances are made. The injecting needle reaches some tubes or certain lobes more directly, to the exclusion of others. "One cannot imagine," says Charpy, "other means capable of producing these lesions than the injection on the living." It is incontestable that these specimens came from experiments made on living man and sometime before death: eight or ten days or even longer. Even supposing that these injections were made under anesthesia, it is certain that the secondary reaction, the congestion and the edema caused pain. The aim of these experiments was probably an attempt to perfect an injection capable of sterilizing a man. The fact that the fixation was good indicates to the histologist that the patients were sacrificed immediately before the removal of the specimen. The volume of 2 of the specimens indicated that they were from testes of children aged 13 and 15 years. The Académie decided to break off all scientific relations with the German scientists until such time when they shall have rigorously cleansed their scientific organizations. Other proofs not less valid than those of Professor Charpy demonstrated that man was regarded by the Germans as a guinea pig.

Dr. Henri Chrétien, who was held for two years in a torture camp, furnished information collected first hand regarding methods of scientific extermination. He saw arrive at his camp, in the Vosges, two groups of 40 Gipsies each. The following day a professor from Strasbourg in SS uniform, accompanied by an orderly, inoculated typhus by scarification into one of the groups. Dr. Paulson, detained Norwegian physician, was charged to look after the "experimental animals." All developed typhus. Another group of Gipsies were subjected to tests with toxic gases; others were assigned for experiments on freezing.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, July 30, 1945.

Special Medical Courses

In connection with the regular work of the University of Rio de Janeiro, an intensive postgraduate course in obstetrics and gynecology is being given during the current month at the Hospital Pro-Matre under the direction of Dr. J. M. Moniz de Aragão, associate professor at the university. Besides Dr. Aragão, Drs. Octavio de Souza, J. Berla de Niemeyer, Goulart de Andrade, Humberto F. Faria and C. Correa da Costa are in charge of the lectures and practical demonstrations included in the course. Cancer of the uterus, anomalous nidation, feminine sterility, sudden death during labor, brucellosis during pregnancy, the x-rays in obstetrics and fetal erythroblastosis are among the special topics included in the course.

A postgraduate course in plastic surgery is now being given at the University of São Paulo under the direction of Dr. J. Rebelo Neto, head of the department of plastic surgery at the Santa Casa Hospital of that city. Dr. Duarte Cardoso and Dr. Victor Spina are also in charge of the course, which includes lectures, practical demonstrations and operations.

A special course in medical psychology and cerebral physiology will be given at the Policlinica de São Paulo. Dr. Francisco Tancredi and Dr. Annibal Silveira are in charge of the lectures and practical demonstrations of the course.

The Hospitals of the City of Rio de Janeiro

The city of Rio de Janeiro (Federal District) has at present ninety-five hospitals, adding up a total of 18,211 beds, with an average of 191.7 beds per hospital. For the population of 1,950,000 these figures correspond to 20,526 persons for each hospital and 107 persons for each bed. The largest institutions are the Misericordia General Hospital (991 beds), the Portuguese General Hospital (585 beds), the Juliano Moreira Suburban Psychopathic Colony (2,800 beds), the Army Central Hospital (868 beds), the Curupaity Suburban Leprosarium (594 beds) and the St. Sebastião Tuberculosis Hospital (500 beds). These hospitals are divided into three main groups: the private institutions, of which there are sixty-seven with 7,101 beds (or 105.9 per hospital), the federal institutions, numbering eleven with 7,530 beds (or 684.5 per hospital) and the municipal institutions, seventeen with 3,580 beds (or 210.6 per hospital).

According to the specialties, these institutions are divided into thirty-eight general hospitals with 8,112 beds, nine hospitals for surgery only with 423 beds, five children's hospitals with 414 beds, thirteen maternities with 532 beds, seventeen psychopathic hospitals with 6,519 beds, ten hospitals for the tuberculous with 1,403 beds, one for the isolation of acute transmissible diseases with 90 beds, and two for the leprous with 718 beds. Among the general hospitals three are military, the Army Central Hospital with 868 beds, a navy hospital in an island of the bay with 434 beds, and the small but good Central Hospital of the Air Ministry with 181 beds, where several American service men have been treated. There are at present annually

in Rio de Janeiro about 36,000 births, 6,200 deaths from tuberculosis, 6,000 deaths of infants and 12,000 known cases of acute transmissible diseases (and about 30 per cent more of unknown cases). The largest number of beds for mental cases are in federal hospitals, because these hospitals are included in the Division of Mental Hygiene of the National Department of Health. An ambitious plan of extension and improvement in the hospitals of Rio de Janeiro is now being carried out by the city administration. A modern municipal general hospital with about 600 beds is almost completed. This hospital will be known as the Pedro Ernesto Hospital, the name of a popular physician who was mayor of Rio de Janeiro from 1931 to 1935.

Extension of the Area of Visceral Leishmaniasis in South America

Dr. Madureira Pará, pathologist of the Laboratory of the Rockefeller Foundation in Rio de Janeiro, has confirmed a diagnosis of visceral leishmaniasis after the examination of the material sent from a case in the republic of Colombia by Dr. Augusto G. Gast of the Service of Viscerotomy of the Division of Special Studies of the Ministry of Labor, Hygiene and Social Welfare. During his routine of viscerotomy in connection with the yellow fever work, Dr. Gast found a sample of liver taken from the dead body of a 3 year girl from San Vicente de Chucuri, Santander, Colombia, with abundant forms of Leishmania. Since this would be the first case of infantile kala-azar registered in the country, the material was sent for a more careful examination to the Rio de Janeiro laboratory. The case occurred in a rural mountainous district at the altitude of some 2,650 feet, the mean annual temperature of which is 73 F. The epidemiologic study made by Dr. Santiago Rengifo demonstrated the presence of Phlebotomus in the region. It is interesting to point out the coexistence of a case of cutaneous leishmaniasis in a young sister of the victim, as well as the frequency of this type of skin lesions in the same district.

A New School of Public Health

The Institute of Hygiene of the University of São Paulo, where a postgraduate course in public health and hygiene was given for several years, has now been transformed into a School of Public Health and Hygiene under the direction of Dr. Paula Souza, who holds a diploma of doctor in public health from the Johns Hopkins University. This is the first university school of the kind to exist in this country. Drs. Borges Vieira, P. Egydio de Carvalho, Alcantara Machado, Alexandre Wancolle, Lucas Assumpção and Arthur A. Whitaker are professors at the new school. Dr. Paula Souza, still absent in the United States, has just served as a member of the delegation of Brazil at the world security conference of San Francisco.

Meeting of Brazilian Ophthalmologists

The twenty-third annual meeting of the Brazilian Society of Ophthalmology will be held at Rio de Janeiro from the 1st to the 6th of September. The principal subjects to be discussed at the meeting are the treatment of ocular syphilis, operation of strabismus, plastic surgery of the orbit, sutures in the operation of cataract, binocular vision in the strabismus and the fundus oculi in the infant. During the meeting Dr. Mendonça Barros of São Paulo will present an extensive report on the present conditions of ophthalmology in the United States, which he recently visited.

Personal

Dr. Hugo Pinheiro Guimarães has been inaugurated as president of the Brazilian College of Surgeons for the year 1945-1946. Dr. Guimarães is professor of surgery at the University of Rio de Janeiro. Dr. Barbosa Vianna, the retiring president, is professor of clinical orthopedics at the same university.

Brief Items

Mr. José Martinelli, a businessman of Rio de Janeiro, has donated a sum corresponding to $250,000, and a valuable parcel of land, to the Cancer Division of the National Department of Health, in cooperation with the government in the campaign against cancer.

Dr. Deolindo O. Couto has been appointed professor of clinical neurology at the University of Rio de Janeiro. Dr. Couto was formerly associate professor of neurology at the same university and physician of the National Psychiatric Hospital of Rio de Janeiro.

Dr. Emilio Mira y Lopez, professor of neuropsychiatry at the University of Barcelona and director of the Psychotechnic Laboratory of that city, is now at Rio de Janeiro. Invited by the Brazilian government, Dr. Mira y Lopez will give a short course of lectures and practical demonstrations on the myokinetic method of psychodiagnosis. The subjects of some of these lectures will be new directives of psychiatry, mental hygiene of adolescence, some results of the work of the Psychotechnic Laboratory of Barcelona and measurement of aptitudes for vocational guidance. The Spanish physician has been honored by the University of Rio de Janeiro and by the Brazilian Society of Neurology and Psychiatry.

Dr. Beatrice Berle, wife of the American ambassador at Rio de Janeiro and herself a distinguished physician, has given a lecture at the Misericordia Hospital on the psychosomatic correlation in the diseases of the digestive system, particularly peptic ulcer. The lecture was accompanied by the presentation of some interesting patients by Dr. Figueiredo Mendes.

Several new services have been inaugurated at the Hospital Moncorvo Filho, a municipal institution of Rio de Janeiro: the blood bank, the division of ophthalmology, the division of otorhinolaryngology and the division of necropsies.

An intensive campaign of rural health instruction, conducted by the Division of Health Education of the Special Service of Public Health, has begun in the state of Pará, in the Amazon valley, under the supervision of Dr. Charles Wagley. Several mobile units of moving picture projection are being used.

Dr. Tarquinio Lopes Filho, a practitioner of medicine at Rio de Janeiro since 1909, died recently at the age of 64.

Dr. Alfredo Souza Mendes of Rio de Janeiro died recently at the age of 59.

Marriages

CHARLES LYMAN JORDAN JR., Kinston, N. C., to Miss Florence Fisher Henszey of Philadelphia in Atlanta, Ga., June 23.

JOEL BERNARD HOBERMAN, Arlington, Va., to Miss Sally Winn Chappelear at Braddock Heights, Md., July 4.

RANDOLPH HARRISON HOGE, Richmond, Va., to Miss Florence Irene Elks of Weldon, N. C., June 23.

CHAMPE C. POOL, Charleston, W. Va., to DR. MARJORIE BIRD KISHPAUGH of Hershey, Pa., recently.

RICHARD A. FEWELL, Philadelphia, to Miss Mary White McNeely of Cooleemee, N. C., June 20.

FRANK A. MCCUE, Bluefield, W. Va., to Lieut. Betty Barron of Watervliet, N. Y., April 20.

STAFFORD L. NORMAN, Coleman, Texas, to Miss Mattie Ellen Hood of Jacksonville, May 15.

MYRON DUANE MATTISON to Miss Elizabeth Milton Weaver, both of Durham, N. C., June 29.

VIRGIL C. HART to Miss Virginia McGunigal, both of Youngstown, Ohio, March 12.

ROY ALLEN HARE to Miss Myrtle Frances Brandon, both of Durham, N. C., June 20.

WILLIAM T. MOSS, Columbia, Mo., to Miss Rose Daily of Kansas City, June 28.

FREDERICK F. GARRISON, Aurora, Ill., to Miss Myrtle Joy in Loami, July 4.

Deaths

Hugh Hampton Young ✠ eminent urologist, died in the Brady Clinic, Johns Hopkins Hospital, Baltimore, August 23, aged 74.

Dr. Young was born in San Antonio, Texas, Sept. 18, 1870. In four years at the University of Virginia he received the A.B., A.M. and M.D. degrees, graduating at the medical school in 1894. He spent the following year in graduate work at the Johns Hopkins Hospital. He then served as bacteriologist and pathologist at the Thomas Wilson Sanatorium, returning to the Johns Hopkins Hospital as intern, assistant resident surgeon and associate in surgery from 1895 to 1914. In 1897 Dr. Young assumed charge of the dispensary of genitourinary diseases at the hospital, launching a long career devoted to this specialty. In 1915 he became director of the newly opened James Buchanan Brady Urological Institute, the gift of "Diamond Jim" Brady, on whom Dr. Young had performed a prostatectomy in 1912.

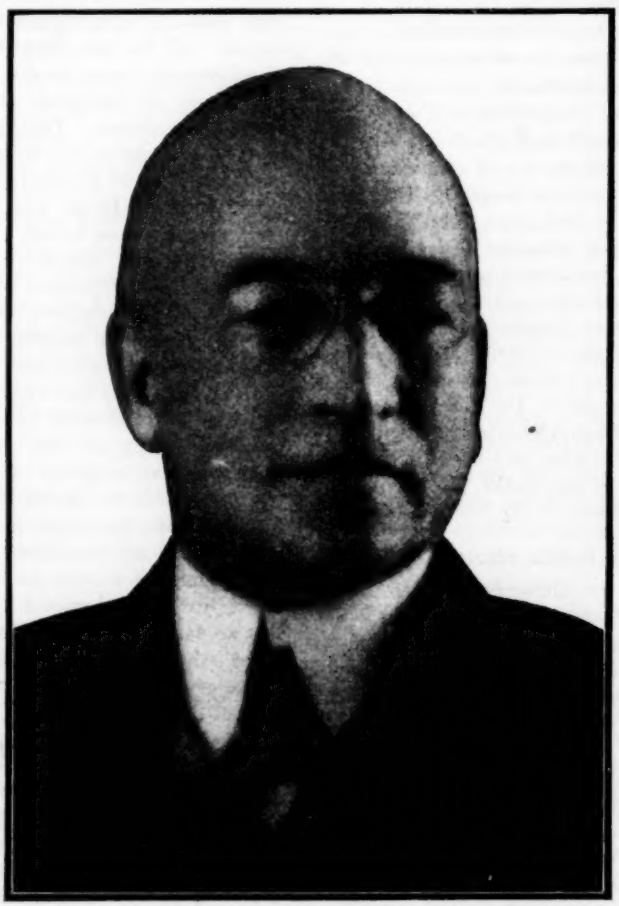
During his career he held various teaching positions at the Johns Hopkins University School of Medicine, becoming emeritus professor of urology in 1942, the year he retired as director of the Brady Clinic. His scientific achievements include the creation of the perineal prostatectomy, for which he devised special instruments, the radical operation for cancer of the prostate, the invention of the cystoscopic rongeur and an instrument for placing radium in bladder tumors.

Other accomplishments include his successful activities as a citizen. In 1903 he was credited with influencing the passage of bills which had a nationwide effect in the campaign against tuberculosis; he was also active in the creation of the National Institute of Health and as chairman of the Maryland State Lunacy Commission and of the state board of mental hygiene, into which it later developed. Dr. Young was credited with the passage of numerous bills improving the mental hygiene structure of the state.

Dr. Young was a member of numerous scientific groups, serving as president in 1909 of the American Urological Association, of which he was a charter member, and of the American Association of Genito-Urinary Surgeons, in 1912 of the Medical and Chirurgical Faculty of Maryland and in 1917 of the International Congress of Urology. He was secretary of the Section on Genito-Urinary Diseases of the American Medical Association from 1911 to 1913, serving as a member of the House of Delegates in 1910, 1914 and 1926. For years he had been chairman of the Maryland State Aviation Commission and with Governor Ritchie had been active in the selection of sites for airports. He had delivered famous lectures and had received various honors, including the Keyes Gold Medal of the American Association of Genito-Urinary Surgeons and the Amory Prize. A prolific contributor to the literature, he had also written a number of volumes on urology and had been editor of the *Journal of Urology* since he founded it in 1917. In 1940 he published his autobiography. He went to France in 1917 with the American Expeditionary Forces as director of urology, becoming senior consultant the following year. He received the Distinguished Service Medal.

His cultural pursuits were many. Throughout the years he had been at various times vice president of the Baltimore Museum of Art and president of the Baltimore Opera Club, the Lyric Theater and the War Memorial which served to commemorate Maryland heroes of World War I. The opera club this year presented him with a silver remembrance carrying an inscription of his contributions of time and energy during its twenty-five years' existence. He had been chairman of the Maryland commission of the New York World's Fair and commodore of the Gibson Island Yacht Squadron.

Dr. Hugh Young was the valued friend of many leaders in public life, a physician to several presidents of the United States, a man of boundless drive and dynamic enthusiasm. He gave spirit and leadership to every one of the many activities in which he participated.



HUGH HAMPTON YOUNG, 1870-1945

Paul Brown Welch ✠ Coral Gables, Fla.; University of Illinois College of Medicine, Chicago, 1913; born in Wauneta, Kan., in 1889; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; interned at the Cook County Hospital in Chicago; formerly an instructor in internal medicine at his alma mater and an instructor of gynecology and obstetrics at the Rush Medical College in Chicago; on the visiting staff of St. Francis Hospital in Miami Beach; served as chief gastroenterologist at the James M. Jackson Memorial Hospital in Miami, where in 1938 he served as president of the staff and where he died May 6, aged 55, of coronary thrombosis.

Millard Freeman Sewall ✠ Bridgeton, N. J.; Jefferson Medical College of Philadelphia, 1903; born in York, Maine, Sept. 28, 1878; fellow of the American College of Surgeons; served during World War I; formerly an intern at St. Agnes Hospital and resident physician at Girard College, both in Philadelphia; for many years chief of surgical staff at Bridgeton Hospital; past president of the Cumberland County Medical Society and the Tri-County Medical Society; honorary member of Cape May County Medical Society; chief of local emergency defense corps; served on the Selective Service board; died June 4, aged 66, of cerebral hemorrhage and thrombosis.

Thomas Francis Welsh, Salt Lake City; Creighton University School of Medicine, Omaha, 1925; born in Park City, Utah, April 22, 1900; member of the American Medical Association, American Academy of Ophthalmology and Otolaryngology, Western Ophthalmological Society and the Pacific Coast Oto-Ophthalmological Society; fellow of the American College of Surgeons; specialist certified by the American Board of Ophthalmology and the American Board of Otolaryngology; served on the staffs of the Holy Cross and St. Mark's hospitals; consultant at the Veterans Administration Facility; died May 13, aged 45, of coronary occlusion.

Richard Metcalf ✠ Winthrop, Mass.; Tufts College Medical School, Boston, 1913; died May 21, aged 5[illegible], of coronary thrombosis.

Mack L. Ross, Topeka, Kan.; Meharry Medical College, Nashville, Tenn., 1913; member of the American Medical Association; on the staffs of St. Francis Hospital and Christ's Hospital, where he died May 21, aged 66, of acute myocardial failure.

George W. Walbright ✠ Metropolis, Ill.; University of Louisville (Ky.) School of Medicine, 1931; coroner of Massac County; served in the medical corps, Army of the United States, from Dec. 5, 1940 until Feb. 25, 1944, when he was honorably discharged because of physical disqualification; died May 24, aged 37, of coronary thrombosis.

DIED WHILE IN MILITARY SERVICE

William Tyson Bower, Philipsburg, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1942; served an internship at St. Luke's Hospital in Bethlehem; began active duty as a first lieutenant in the medical corps, Army of the United States, on July 3, 1943; assigned to Company C, 93d Medical Gas Treatment Battalion; served in England, France and Belgium, participating in D day operations; promoted to captain; died in Germany April 21, aged 30, of injuries received in a vehicle accident.

Robert Bard Carpenter, Buffalo; University of Buffalo School of Medicine, 1934; interned at the Buffalo City Hospital; served a residency at the Edward J. Meyer Memorial Hospital; an assistant in medicine at his alma mater; entered the medical reserve corps of the U. S. Army as a first lieutenant June 13, 1934; began active duty Nov. 30, 1940 as a captain, promoted to major and lieutenant colonel; commander of the Twelfth Medical Training Battalion at Camp Pickett, Va., where he died Sept. 7, 1943, aged 34, of pulmonary embolism following an operation for an injury received in a fall on a stairway.

William Harold Chain, New Haven, Conn.; Long Island College Hospital, Brooklyn, 1923; formerly an intern at the Buffalo General Hospital in Buffalo and the Hospital of St. Raphael; served in France during World War I; began active duty as a captain in the medical corps, Army of the United States, on June 1, 1942; killed in an automobile accident near Camp Fanning, Texas, Aug. 30, 1943, aged 49.

Clyde Wallace Countryman, Spokane, Wash.; University of Oregon Medical School, Portland, 1924; member of the American Medical Association; interned at the St. Luke's Hospital in Spokane, Bingham Hospital in Bingham Canyon, Utah, and the Salt Lake County Hospital in Salt Lake City; served as secretary-treasurer of the Pacific Northwest Medical Association; began active duty as a major in the medical corps, Army of the United States, on July 5, 1942; later promoted to lieutenant colonel; died in Cuba May 5, aged 44, in an airplane crash.

Joseph Anthony Gadomski, Clinton, Mass.; Boston University School of Medicine, 1943; diplomate of the National Board of Medical Examiners; interned at St. Vincent Hospital in Worcester; began active duty as a first lieutenant in the medical corps, Army of the United States, on Dec. 31, 1943; died in eastern France January 2, aged 29.

Lewis Henry Jannarone, Belleville, N. J.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1939; served internships at the Essex Mountain Sanatorium in Verona and the Jersey City Hospital in Jersey City; began active duty in the medical reserve corps of the U. S. Army as a first lieutenant on Oct. 18, 1941; assigned to Station Hospital in Fort Benning, Ga.; later promoted to captain; died in the Walter Reed General Hospital, Washington, D. C., Oct. 31, 1944, aged 30, of malignant cholangioma.

Philip Joseph Lopresti, Oak Park, Ill.; University of Illinois College of Medicine, Chicago, 1941; interned at the Cook County Hospital in Chicago; entered the medical reserve corps of the U. S. Army as a first lieutenant on Aug. 1, 1941; began active duty in the same grade in the medical corps, Army of the United States, on Jan. 16, 1943; assigned to Station Hospital, Westover Field, Chicopee Falls, Mass.; later promoted to captain; died in Italy, February 2, aged 28, in an airplane accident.

Otis Milton Marsh, Minneapolis; University of Minnesota Medical School, Minneapolis, 1941; member of the American Medical Association; interned at the Minneapolis General Hospital; began active duty as a first lieutenant in the medical corps, Army of the United States, on July 22, 1942; later promoted to captain; died in the Territory of Hawaii Dec. 24, 1944, aged 30, of pulmonary infarction.

Adolph Edwin Schecter, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1937; served an internship and residency at the Philadelphia General Hospital; assistant instructor in medicine at his alma mater; began active duty in the medical corps, Army of the United States, as a captain on May 17, 1942; assigned to 20th General Hospital, Camp Claiborne, La.; served in North Africa, Sicily, Sardinia, Italy and France; died aboard ship returning to the United States March 28, aged 31.

Marshall Godfrey Seibel ✠ St. Louis; University of Louisville (Ky.) School of Medicine, 1929; interned at the New Haven Hospital in New Haven, Conn.; began active duty as a lieutenant commander in the U. S. Naval Reserve on July 29, 1942; died in the Pacific area Sept. 25, 1944, aged 42, of coronary thrombosis.

Charles George Sinclair ✠ Colonel, M. C., U. S. Army, Radburn, N. J.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1914; in 1916 graduated at the Army Medical School in Washington, D. C., where he had been instructor of pathology and bacteriology; formerly instructor in microbiology and pathology, Army School of Nursing, Washington, D. C.; assistant professor of hygiene at the University of Michigan from 1911 to 1913; entered the medical reserve corps of the U. S. Army as a first lieutenant in August 1915 and the medical corps of the regular army in May 1916; rose through the various ranks to that of colonel; served in the Mexican punitive expedition and World War I; fellow of the American College of Physicians; served as chief in the laboratory service at Walter Reed General Hospital in Washington, D. C.; in charge of Sixth Service Command Laboratory at Fort Sheridan, Ill., and the Tripler General Hospital in Honolulu; an editor of *Biological Abstracts;* author of "Microbiology and Elementary Pathology"; died in the Percy Jones Hospital, Battle Creek, Mich., May 3, aged 55, of carcinoma adenomatosum with multiple metastases.

Eugene Willis Springer, Pontiac, Mich.; University of Michigan Medical School, Ann Arbor, 1936; member of the American Medical Association and the Iowa State Medical Society; interned at the Hurley Hospital in Flint, where he later served a residency in medicine; served a residency in ophthalmology at the University Hospitals, Iowa City; entered the medical reserve corps of the U. S. Army as a first lieutenant on June 20, 1938; began active duty as a first lieutenant in the medical corps, Army of the United States, on July 13, 1942; later promoted to captain; died in Egypt February 23, aged 34.

David Brakenridge Stuart ✠ Roanoke, Va.; Medical College of Virginia, Richmond, 1924; interned at the Hygeia Hospital in Richmond; formerly on the staff of the Lewis-Gale Hospital; began active duty as a captain in the medical corps, Army of the United States, on July 25, 1942, in charge of a hospital train which evacuated wounded from the western front; went overseas in October 1943; promoted to major; died in Belgium April 14, aged 44, of arteriosclerotic heart disease.

Jehu Creed Walker, Savannah, Tenn.; University of Tennessee College of Medicine, Memphis, 1936; interned at the T. J. Samson Community Hospital in Glasgow, Ky., the Baptist Memorial Hospital in Memphis and the Spartanburg General Hospital in Spartanburg, S. C.; began active duty as a first lieutenant in the medical corps, Army of the United States (National Guard), in January 1941; assigned to Medical Detachment, 149th Infantry, Camp Shelby, Miss.; later promoted to major; flight surgeon with the Eighth Air Force; held the Air Medal and Bronze Star; killed in an aircraft crash in England April 12, aged 31.

Dwight Dunham Young, Santa Ana, Calif.; Columbia University College of Physicians and Surgeons, New York, 1928; member of the American Medical Association; fellow of the American College of Surgeons; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; in charge of obstetrics at the Orange County General Hospital and visiting obstetrician and gynecologist at St. Joseph Hospital, both of Orange; commissioned a lieutenant commander in the medical corps, U. S. Naval Reserve, in March 8, 1942; promoted to commander on Nov. 18, 1942; while in the Pacific, survived the sinking of the U. S. Transport *Little;* died in May, aged 42.

Correspondence

THE RELATION OF EFFORT TO ACUTE ATTACKS OF MYOCARDIAL INFARCTION

To the Editor:—In an article in THE JOURNAL, July 14, entitled "The Relation of Effort to Attacks of Acute Myocardial Infarction," Blumgart has challenged the work of my associates and myself. He believes that in a "small proportion" of cases strenuous exercise may induce coronary occlusion. We believe that in no instance is there any relation.

First one must distinguish clearly between myocardial infarction due to coronary occlusion and that occurring without this complete obstruction. Correct terminology is absolutely essential in discussions of this subject. I take it that Blumgart refers to coronary occlusion, since coronary thrombosis was found in the 4 patients that came to autopsy. In the other seven I am not so sure.

I am well aware that effort may precipitate myocardial infarction without coronary occlusion, induce heart failure and, in fact, cause sudden death. Coronary occlusion is something else again. It is the end result of arteriosclerosis, and no effort, trauma or emotion will produce it.

Blumgart believes that "myocardial infarction" is on the increase in the Army because of strenuous effort that military personnel are called on to perform. The cardiac deaths he reports among men in the Army do not prove his contention, because in civilian life medical examiners find "sudden and unexpected natural deaths" quite common (Helpern, Milton, and Rabson, M. S.: Sudden and Unexpected Natural Death, *New York State J. Med.* **45**:1197 [June 1] 1945).

The arguments that appear in Blumgart's paper have been made before. Thus he repeats a paragraph written by Boas to make the point that effort may induce coronary occlusion. Here it is: "The fact that pneumothorax is due usually to pulmonary tuberculosis or to the rupture of an emphysematous bleb does not negate that it may follow trauma to the chest." My reply is simply this: Of course, trauma may cause pneumothorax, but neither pneumothorax nor trauma is under discussion.

Playing baseball, volley ball, running, hiking, marching and engaging in maneuvers, gymnastics and swimming are not necessarily unusual exertion for soldiers. Millions of army men undergo strenuous physical training, and such activities may well have become routine for them. In the eleven short case histories presented, a history of unusual effort is not definitely stated to have been elicited. Only in case 7 is there a suggestion that the run over an obstacle course may have been an unusual physical exertion, but even in this instance there is no statement that this officer had not made the "run" before.

If unusual effort induced coronary occlusion, men and women with coronary sclerosis would sustain this vascular disease daily by the thousands after any extreme effort. This is not so despite the fact that we repeatedly run for a train, move a piece of heavy furniture, pull with unusual effort at a stuck drawer, lift a heavy bundle or suitcase, shove through a crowded subway train or squirm and strain while parking a car in a small space in a crowded thoroughfare. If coronary occlusion were induced by strenuous effort, our life span would be 40 to 50 years, not 60 to 70.

The 11 cases cited in which there appears to be a time association between effort and coronary occlusion are incomplete stories. Although they are inconclusive they influence the reader who may not have an adequate basis of his own for deciding whether strenuous exertion is or is not an immediate cause of coronary occlusion. He does not know of the hundreds of cases that the cardiologist has had in which coronary occlusion transpired during sleep, rest or mild and usual activity (Master, A. M.; Dack, Simon, and Jaffe, H. L.: Activities Associated with the Onset of Acute Coronary Artery Occlusion, *Am. Heart J.* **18**:434 [Oct.] 1939; The Role of Effort, Trauma, Work and Occupation in the Onset and Subsequent Course of Coronary Artery Occlusion, *M. Ann. District of Columbia* **10**:79 [March] 1941). In my four years of active service in the Navy I have not seen a single case of coronary occlusion etiologically related to effort.

Sustained and specialized experience leads me to the belief that, even in the rare situation in which there is an apparent time relation between unusual effort and the coronary occlusion, this relationship is not causal but mere coincidence which may be expected in the thousands of attacks of coronary occlusion which take place daily in this country (Master, Jaffe and Dack: The Prevalence of Coronary Artery Occlusion, *New York State J. Med.* **39**:1937 [Oct.] 1939).

Let us analyze the 11 cases that are so seriously lacking in detail: "A captain in the Signal Corps, aged 41, collapsed on a hike and was dead at arrival to the hospital." What was the captain's condition before the hike? Isn't it just as logical to assume that he had experienced his coronary occlusion some time before he started his hike as to assume that the hike produced sudden collapse and death? Before important conclusions are drawn much more pertinent information is essential. Only 4 of the 11 patients came to autopsy. The other 7 gave electrocardiograms which were "characteristic." No mention is made of RS-T segment elevations, of Q waves, of reciprocal relationships of leads 1 and 3, so specific for coronary occlusion. Despite our deep respect for the author's professional competence, we must insist that a scientific paper requires more precise data.

As was observed, Blumgart's arguments have been made before. Thus it has been said that since intimal hemorrhages are often observed in coronary occlusion, effort must be the cause. It is asserted that exertion raises blood pressure and this ruptures a subintimal capillary. Is this reasoning any better than concluding that exertion causes red blood cell destruction in the body, a process we ordinarily consider to be physiologically normal? Intimal hemorrhages (Winternitz, M. C.; Thomas, R. M., and Le Compte, P. M.: The Biology of Arteriosclerosis, Springfield, Ill., Charles C Thomas, 1938) are but a part of the process of arteriosclerosis.

Blumgart cites that Henry Horn and L. E. Finkelstein (Arteriosclerosis of the Coronary Arteries and the Mechanism of Their Occlusion, *Am. Heart J.* **19**:655 [June] 1940) show that coronary occlusion frequently results from subintimal hemorrhage. However, these authors specifically stated that increased blood pressure following effort played no role in the production of intimal hemorrhage. We have reported intimal hemorrhage at autopsy to be as frequent in coronary disease in patients without hypertension as in those with increased arterial tension (Master, Dack and Jaffe: The Role of Effort, Trauma, Work and Occupation in the Onset and Subsequent Course of Coronary Artery Occlusion). The hemorrhages have been observed just as frequently in patients who have been bedridden for weeks before the coronary occlusion, suffering from cancer, lung trouble and heart failure, as in those who have had high blood pressure and were active before sustaining the coronary occlusion. If more evidence is required that bodily exertion is not a factor in subintimal hemorrhage of coronary sclerosis, I would cite Winternitz's work (Winternitz, Thomas and Le Compte: The Biology of Arteriosclerosis). He injected fluid into the coronary arteries of men whose hearts showed advanced coronary sclerosis under the unheard of pressure of 500 to 1,000 mm. of mercury without producing intimal hemorrhage.

Over a period of years my associates and I have analyzed with utmost care the histories of 1,700 episodes of coronary occlusion and have come to the conclusion that this is an entirely fortuitous end result of progressive coronary arteriosclerosis. It is as frequent in the sedentary as in the physically active. Coronary occlusion is not related to effort, to occupation or to a particular social class. The percentage of attacks which occur during sleep, rest and mild or moderate activity coincides with the proportion of the twenty-four hours usually spent in these respective states. Only 2 per cent of the attacks were related in time to severe exertion. For the reasons given we concluded that the small percentage is expected coincidence. We find support in John Dewey's insistence that a sequence is not necessarily a consequence. But of course a simple attack of angina pectoris and myocardial necrosis without coronary occlusion must be differentiated sharply from the coronary occlusion, and they are induced by effort.

ARTHUR M. MASTER, M.D., St. Albans, L. I., N. Y.
Cardiologist, U. S. Naval Hospital.

NICOTINIC ACID IN VINCENT'S ANGINA

To the Editor:—In THE JOURNAL, July 7, are two interesting articles on the use of penicillin in Vincent's angina. From the experience of Captain Schwartz and of Major Shallenberger, Lieutenant Colonel Denny and Major Pyle there is no reason to doubt that penicillin is quite effective in acute cases of Vincent's angina. I am writing, not to question the effectiveness of penicillin, but to suggest that nicotinic acid (or niacin) or nicotinamide has been found by myself and a number of others to be just as effective as penicillin in such cases. Since it is much simpler to take a 50 mg. tablet three times a day than to have an intramuscular injection every three hours for five doses, or even to have penicillin applied locally every four hours, it seems logical to use nicotinic acid first.

So far as I know, J. B. King first called attention to the effectiveness of nicotinic acid in Vincent's disease in the *Lancet* **2**:32 (July 13) 1940. For nearly four years I have been using it in all acute cases of Vincent's angina and have found it eminently satisfactory. The dose employed is 50 mg. three times a day for adults; for children, 10 mg. and upward according to age. A week's treatment is usually sufficient. The temperature in all my cases has subsided within forty-eight to seventy-two hours, and the smears have been negative within four to seven days.

WINGATE M. JOHNSON, M.D., Winston-Salem, N. C.

"PSEUDODOXIA PEDIATRICA"

To the Editor:—Your interesting editorial on pseudodoxia pediatrica (THE JOURNAL, July 28, p. 955) prompts me to write you that here in Vinton County, Ohio, in the past twelve years I have delivered in homes comparable to those served by the Frontier Service 1,300 babies without a maternal mortality. In this series there were four cesareans done in hospitals, the only ones in the series. The infant mortality is unusually low.

Since the advent of the sulfonamides I have not seen a tympanic membrane go to rupture and have not had a mastoid that required surgery, nor have I done a myringotomy.

Alone down here the past three years it is encouraging to read that we are doing things comparable to other sections, and it is also further evidence that rural communities are in most cases as well off medically as the larger cities.

H. D. CHAMBERLAIN, M.D., McArthur, Ohio.

THERAPEUTIC USE OF ARTIFICIAL RADIOACTIVITY

To the Editor:—During the past several years the artificially produced radioactive elements have become available for use in biologic and medical research as "tracers." So-called tracer doses of these elements, in metabolic studies, are supposedly so small that there is apparently no danger of harm to the organism either immediate or delayed. However, these elements are also being used with success at several centers in this country and abroad by intravenous injection in larger or therapeutic doses for the treatment of certain diseases such as hyperthyroidism (radio iodine), leukemia (radio phosphorus), polycythemia vera (radio phosphorus) and metastatic bone tumors (radio strontium). Some workers, after a short experience in the therapeutic use of these substances, have become a bit too enthusiastic regarding their value. As far as I am aware, no "cures" have been accomplished. The immediate dangerous possibilities of any form of irradiation (x-rays, gamma rays, radium, artificial radioactivity) are well known to most physicians, but in addition there are possible delayed effects. Cases of aplastic anemia and osteogenic sarcomas have developed after many years among radium dial painters, and it is possible to induce delayed neoplastic change in animals by roentgen or other forms of irradiation. Thus, such larger doses can be harmful. However, in the hands of experienced personnel these dangers can be appreciated and damaging effects avoided. Consequently the therapeutic use of artificial radioactivity must be carefully controlled with these dangers constantly kept in mind. It should be stated that so far there has been no definite evidence of any of these delayed effects as far as I am aware, but these possible complications should always be kept in mind in deciding whether a radio element should be used in therapy. It is this point which I wish to emphasize.

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Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, Aug. 25, page 1249.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II, Nov. 12-14. Part III, New York City, Oct. 15-17; Boston, Oct. 16-17. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th Street, Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various centers, Jan. 18. Final date for filing application is Oct. 20. *Oral.* Various centers, Oct. 1946. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York 24.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* Chicago, May 27. Final date for filing application is Feb. 1. Sec., Dr. P. C. Bucy, 912 S. Wood St., Chicago 12.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written. Part I.* Various centers, Feb. 2. Final date for filing application is Nov. 1. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY: Chicago, Oct. 4-6; Jan. 18-22 and Los Angeles, Jan. 28-Feb. 1. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 3-6 (canceled). Spring 1946. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF PEDIATRICS: *Written.* Locally, Oct. 19. *Oral.* New York, Dec. 7-8. Sec., Dr. C. A. Aldrich, 115½ First Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY. *Written.* Part I. Spring 1946. Final date for filing application is Dec. 1. Sec., Dr. J. Stewart Rodman, 225 South 15th St., Philadelphia.

AMERICAN BOARD OF UROLOGY: *Written.* Various centers, Dec. 9. *Oral.* Chicago, February 1946. Sec., Dr. Gilbert J. Thomas, 1409 Willow St., Minneapolis 4.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Cancer Research, Baltimore

5:321-384 (June) 1945

Incidence of Adrenal Cortical Carcinoma in Gonadectomized Female Mice of Extreme Dilution Strain: III. Observations on Adrenal Glands and Accessory Sex Organs in Mice 13 to 24 Months of Age. G. W. Woolley and C. C. Little.—p. 321.

Porphyrin Excretion of Harderian Glands in Its Relation to Actinic Carcinogenesis in Hairless Rats. W. C. Hueper and F. H. J. Figge. —p. 328.

Influence of Epidermal Cornification on Carcinogenesis in Hairless Rats. W. C. Hueper.—p. 331.

Carcinogenicity of m'-Methyl-p-Dimethylaminoazobenzene and of p-Monomethylaminoazobenzene. Janet E. Giese. J. A. Miller and C. A. Baumann.—p. 337.

Recovery of Carcinogenic Hydrocarbons from Solution by Use of Picric Acid. R. N. Jones and J. R. Jamieson.—p. 341.

Influence of Unsaturated Dibasic Acids on Induction of Skin Tumors by Chemical Carcinogens. H. G. Crabtree.—p. 346.

Milk Induced Mammary Carcinoma in Mice. C. D. Haagensen and H. T. Randall.—p. 352.

Studies on Variation of Rous Sarcoma Virus Following Growth of Tumor in Anterior Chamber of Guinea Pig Eye. E. W. Shrigley, H. S. N. Greene and F. Duran-Reynals.—p. 356.

Metabolic Studies on Leukemic Mice with Aid of Radioactive Phosphorus. K. G. Scott.—p. 365.

Incidence of Malignant Tumors in British West Indian and Panamanian Negro Autopsy Populations. W. J. Tomlinson and L. A. Wilson Jr. —p. 368.

Journal of Thoracic Surgery, St. Louis

14:187-264 (June) 1945

Surgical Treatment of Lesions of Lower Esophagus and Upper Stomach. H. H. Bradshaw and J. F. O'Neill.—p. 187.

Readhesion After Intrapleural Cauterization. R. J. C. Maxwell.—p. 194.

Presternal Cyst: Report of Case. W. D. Seybold and O. T. Clagett. —p. 217.

Question of Pulmonary Damage with Artificial Respiration. O. S. Orth, Rosaline L. Wilhelm and R. M. Waters.—p. 220.

*Lung Abscess Caused by Bacteroides Necrophorus: Report of Case with Autopsy. W. P. Callahan, P. R. Beamer and A. R. Valle.—p. 231.

Significance of Fluid in Pleural Space: Study of 274 Cases. W. S. Tinney and A. M. Olson.—p. 248.

Cystic Lymphangioma of Mediastinum. S. Sanes, J. E. Macmanus and G. N. Scatchard.—p. 253.

*Nontuberculous Lung Abscess in Children: Survey of 64 Cases. V. D'Ingianni.—p. 258.

Lung Abscess Caused by Bacteroides Necrophorus.—Spontaneous infections with Bacteroides necrophorus occurring in domestic animals and birds producing an acute type of necrotizing inflammation of the mucous membranes, skin, lungs and liver are well known to veterinarians, but human infections with this organism are rare. Callahan and his associates report a case of lung abscess in a man whose occupation of wool and fur buyer brought him in contact with green hides of cattle and sheep, which was possibly the source of infection. The history of a sore throat, which subsequently disappeared, followed by signs of pulmonary disease and the subsequent development of a lung abscess, lends strength to the idea that the infection was air borne. The absence of lesions on the surface of the body plus a history of sore throat and the finding of a purulent exudate on the inflamed tonsils suggests that this was the port of entry of the organism into the body. The mechanism of the formation of the abscess in the lower lobe of the right lung was probably the aspiration of infected material. The disease process was confined to the respiratory system and there was an attempt on the part of the host to heal the infection by the formation of a dense wall of fibrous tissue around the abscess cavity. Rupture of the abscess into a bronchus occurred, with spread of infection to other lobes of the lungs. A gram-negative, pleomorphic rod with filamentous and coccobacillary forms was isolated from the pulmonary lesions at necropsy. This organism was an anaerobe. Pathogenicity for rabbits, guinea pigs and mice was demonstrated. A rabbit was hyperimmunized with a known strain of Bacterium necrophorum and the obtained serum agglutinated the recovered organism in dilutions of 1:320 and the specific antigen in dilutions of 1:640. On this evidence the organism was classified as Bacteroides necrophorus. Infections with Bacteroides necrophorus are probably more common than previously supposed.

Nontuberculous Lung Abscesses in Children.—Of 417 cases of lung abscess reviewed by D'Ingianni 64 occurred in children aged 13 years or younger. Etiologic factors in these 64 cases included pneumonia, tonsillectomy, otitis media, whooping cough, aspiration of mucus or of a peanut, diphtheria and the like. The abscesses were most frequent on the right side and in the lower lobes. Sixteen of the patients had multiple abscesses, and 14 of these died. Of the 42 with single abscess 11 died, 10 remained unimproved and 21 were improved. In the remaining 6 it was not stated whether the lesion was single or multiple. The treatment was chiefly symptomatic; only 3 patients received surgical treatment. Of these 1 died. Of the 8 treated with sulfanilamide 5 died. The mortality rate for the entire group was 40.6 per cent. The high mortality indicates that palliative therapy is inadequate. The rigid cavity, with tissues fixed to a bony wall by adhesions, and the fibrous tissue in the bronchi form a rigid fibrous mass about the abscess. Extirpation of the diseased tissue seems a more feasible therapy.

Michigan State Medical Society Journal, Lansing

44:425-528 (May) 1945

Peripheral Vascular Disease. G. de Takats.—p. 477.

Rehabilitation Program for Military Veterans. F. H. Krusen.—p. 484.

Obstetric Hemorrhages. F. H. Falls.—p. 489.

44:529-640 (June) 1945

Organic Digestive Disturbances in Early Life. F. Farber.—p. 587.

Michigan Rapid Treatment Center. N. W. Ryan.—p. 594.

What We Have Learned About Aviation Medicine. C. J. Clark and H. Britton.—p. 597.

Sulfonamide Resistant Gonorrhea. A. W. Frisch.—p. 600.

Pneumococcus Type III Meningitis Complicating Diabetes Mellitus: Recovery with Chemotherapy and Penicillin. J. L. Dill.—p. 603.

New England Journal of Medicine, Boston

232:665-690 (June 7) 1945

Lymphosarcoma of Bowel in Childhood. G. D. Cutler, R. B. Stark and H. W. Scott.—p. 666.

*Shock in Acute Infections. H. D. Warren, V. G. Balboni, F. T. Rogliano and A. Feder.—p. 671.

Ophthalmology. E. B. Dunphy.—p. 675.

Splenitis, Acute and Chronic, with Marked Splenomegaly. E. M. Chapman.—p. 681.

Hepatoma with Metastases to Lungs, Adrenal Glands and Vertebras. B. Jacobson.—p. 684.

232:691-718 (June 14) 1945

Pseudodoxia Pediatrica. H. Bakwin.—p. 691.

Evaluation of Sulfonamide Ointment Bases. R. W. Howard.—p. 698.

Undescended Testicle. W. C. Quinby.—p. 701.

Periarteritis Nodosa, Involving Especially Heart and Lungs. F. M. Rackemann.—p. 704.

Carcinoma of Stomach with Metastases to Regional Lymph Nodes, Pleura, Lung, Pericardium, Peritoneum and Vertebras: Lymphatic Spread of Pulmonary Metastases. W. Richardson.—p. 708.

Shock in Acute Infections.—Warren and his co-workers discuss the form of shock that occurs with acute infections. This syndrome is manifested by apathy, cold clammy skin, shallow respirations, a thready rapid pulse and low blood pressure. Shock of the so-called secondary type, or what may be better termed "cold shock," during the course of acute infection is due to failure of the peripheral circulation with pooling of the blood in the capillaries. The authors report 3 cases typical of the therapeutic problems presented by three serious infections. The first case was one of severely toxic scarlet fever. The temperature and some of its toxic manifestations were controlled by intravenous administration of pooled convalescent scarlet fever serum. However, the tone of the vascular system did not return until the fourth day, and during that time intravenous fluid and plasma were necessary to maintain the blood

pressure at a critical level. The second case was a fulminating meningococcemia with a massive invasion of the blood stream by bacteria and bacterial products. Many of these patients die in severe shock before the infection can be controlled by chemotherapy. In this case it was possible by the use of intravenous fluid and plasma to maintain the circulating blood volume and blood pressure at a critical level until the infection could be controlled by sulfadiazine. In the third case, one of type III pneumococcic pneumonia, the circulating blood volume was maintained by intravenous plasma and fluids while the infection was being treated with sulfadiazine and type III antiserum. The institution of specific measures to combat the infection is of primary importance, since they are directed at the cause of the shock state. Death in the early stages of acute fulminating infections may occur as a result of secondary shock. If vigorous antishock therapy directed to maintain an adequate circulating blood volume is resorted to, many patients may be maintained until specific serum or chemotherapy or both have been able to control the infection.

New Jersey Medical Society Journal, Trenton

42:167-204 (June) 1945

Fatal Reaction Following Intravenous Injection of Mercupurin: Review of Literature and Report of Case in Which High Environmental Temperature Was a Contributing Cause. S. Ben-Asher.—p. 174.
Resolution on Misuse of Barbituric Acid Derivatives. J. L. Mahaffey.—p. 178.
*Further Evidence of Relationship Between Herpes Zoster and Varicella. E. C. Kern.—p. 179.
Better Test Meal. M. A. Ogden.—p. 180.

Herpes Zoster and Varicella.—A woman aged 81 visited and cared for a small boy who had just recovered from chickenpox. She held the boy on her lap and read to him for several hours. She noticed that the child still had conjunctival irritation and photophobia. Six days later the woman developed a painful red area on the right side of her forehead and two days later she had a typical herpes zoster lesion involving the right supraorbital region. There was some conjunctival injection, a slight cloudiness of the cornea and a very slight ciliary injection. Pain disappeared in five days. The woman had never had chickenpox. Kern suggests that doctors treating either disease should warn those close to the patient of the infectious nature and point out to older persons the danger of contracting herpes zoster after exposure to chickenpox.

Public Health Reports, Washington, D. C.

60:633-660 (June 8) 1945

Incidence of Poliomyelitis in the United States in 1944. C. C. Dauer.—p. 633.
Studies of Acute Diarrheal Diseases: XV. Agglutination Test in Shigella Paradysenteriae Infections. J. Watt and Thelma M. DeCapito.—p. 642.

60:661-692 (June 15) 1945

Influence of Casein and Other Agents on Production of Renal Lesions in Rats by Sulfadiazine and Acetylsulfadiazine. A. Kornberg, K. K. Endicott, F. S. Daft and W. H. Sebrell.—p. 661.
Public Health in Greenland. S. M. Wingo.—p. 676.

Southern Medical Journal, Birmingham, Ala.

38:367-442 (June) 1945

New Approach to Basic Supportive Therapy in Rocky Mountain Spotted Fever. G. T. Harrell, W. A. Wolff and W. Venning.—p. 367.
Chemotherapeutic Studies in Rickettsial and Virus Diseases. H. Pinkerton.—p. 371.
Pancreatitis: Analysis of 22 Cases. W. M. Johnson and O. T. Davis.—p. 373.
Technical Details in Dermatome Grafting. F. T. Wallace.—p. 380.
Cesarean Section Under Spinal Anesthesia. A. Habeeb and H. R. Elliott.—p. 381.
Intercurrent Eclampsia: Analysis of 52 Consecutive Cases Without Maternal Fatality, with a Special Note on Termination of Pregnancy in Antepartum Eclampsia. R. E. Arnell and S. L. Watson.—p. 386.
Importance of Endocervicitis in Urologic Tract Infections. J. A. Seaman.—p. 398.
Treatment of Acute Gonococcal Pelvic Inflammatory Disease in the Female with Penicillin. L. A. Gray.—p. 405.
Use of Penicillin in Certain Eye Diseases. J. F. Hardesty.—p. 411.
Physical Medicine: Its Importance in Rehabilitation Program. F. A. Jostes.—p. 413.
Colles' Fractures. J. W. White.—p. 415.
Suggested Formula for Financial Aid to Local Health Jurisdictions. W. K. Sharp.—p. 417.
Future of Psychiatry in Medical Education. T. A. Watters.—p. 424.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

53:163-216 (June) 1945

Gastric Adenomas: Pathologic Study. J. H. Rieniets and A. C. Broders.—p. 163.
Sterility. O. S. Krebs.—p. 171.
*Pregnancy in the Diabetic. L. J. Palmer and R. H. Barnes.—p. 195.
*Results of Convulsive Shock in Approximately 1,000 Patients. P. S. Wolfe.—p. 203.

Pregnancy and Diabetes.—Palmer and Barnes discuss 68 pregnancies occurring in 41 diabetic women treated at the Mason Clinic during the fourteen years previous to June 1944. The majority of the observations were made during the past six years. Thirty-seven of the pregnancies terminated under their care and 31 terminated elsewhere. Among the 37 pregnancies there were 26 fetuses which reached the age of viability, and there were 22 living children. This number represents 60 per cent of the 37 pregnancies terminated under their care, and 84.6 per cent of these pregnancies which reached the age of viability. Eleven of the 37 pregnancies terminated spontaneously or were terminated intentionally before viability. The authors think that unless future use of substitution endocrine therapy changes the present situation, cesarean section at the thirty-sixth week will be the method of delivery which will produce the highest percentage of fetal survival. They stress that the very wide variation in the percentage of fetal survival is not totally explained by a difference in the manner in which the pregnancy and the diabetes were conducted. There are deeper and more fundamental reasons, and they emphasize that the greatest fetal and maternal (especially the former) risk occurs in the juvenile diabetic patient. Cerebral anoxemia frequently due to edema is the commonest cause of neonatal death, which is related directly to the diabetes. Control of the diabetes during pregnancy is usually relatively simple but must, if possible, be guided by frequent blood sugar determinations. Hormonal imbalance is rapidly becoming recognized as the most common cause of high fetal mortality and maternal morbidity. This imbalance is present in 60 to 70 per cent of pregnant diabetic women.

Results of Convulsive Shock.—Wolfe reports experiences in treating 1,021 patients over a six year period. These patients received a total of 1,313 courses and 11,104 individual shock treatments. Metrazol was used in 4,430 and electric shock in 6,674 treatments. Metrazol has been supplanted largely by electric shock because of its economy and convenience of administration, but there are occasional instances in which metrazol is still preferred. In selecting cases for treatment it is best to avoid those of long standing, and the affective reaction types are preferred to the schizophrenic patients. Many mental illnesses featured by depression respond well to convulsive shock therapy. Behavior problems in chronic psychiatric illness can be improved with shock therapy. It is desirable to try more conservative methods of management before resorting to shock treatment. Prolonged courses of about fifteen seizures are suggested for schizophrenic patients and for the manic patients who are slow to show improvement. For the sluggish schizophrenic patients, metrazol is more effective than electric shock. After shock treatment an observation period of at least two weeks is advised in which time psychotherapy is most effective, and in this period occupational and recreational therapies can be arranged. If a relapse is going to occur, it usually appears during this time. In manic patients a month of observation with a nonstimulatory regimen will prevent some relapses. Repetition of treatment following a relapse is worth consideration in manic depressive psychosis, especially in the depressive type, but it is of questionable value in schizophrenia. The cardiovascular system must be carefully evaluated for cardiac reserve and for evidence of toxic myocarditis before deciding to administer shock. Phlebitis, even if resolving, is a contraindication to treatment. The death rate in this series was 0.49 per cent. The results were best in the affective reaction types, the depressed manic patients responding even better than the manic types; in those with involutional depression and with senile depression the results were fairly good, while in those with schizophrenia with involutional paranoia and with psychoneurosis they were disappointing. Curare is a valuable aid in preventing fractures and dislocations, in allowing treatment in otherwise too risky patients, and it presents little additional hazard, especially if the antidote, neostigmine, is kept at hand.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

20:2-48 (March) 1945

Century of Changes in Mortality and Incidence of Principal Infections of Childhood. A. H. Gale.—p. 2.
Infantile Diarrhea: Analysis of 216 Cases, with Special Reference to Institutional Outbreaks. P. Gairdner.—p. 22.
*Results of Routine Prophylaxis and Treatment of Rickets in Wartime Nurseries. D. Krestin.—p. 28.
Renal Dwarfism: Record of Abnormalities in Carbohydrate Metabolism. M. L. Thomson and Vera K. Wilson.—p. 32.
Congenital Hemiatrophy. Lilly H. Zondek.—p. 35.
*Paroxysmal Tachycardia in Infancy. D. Leys.—p. 44.
Congenital Malformation of Heart in One of Identical Twins. Kathleen McClintock.—p. 47.

Prophylaxis and Treatment of Rickets.—Krestin discusses the results of the routine administration of cod liver oil containing from 600 to 800 international units of vitamin D to the drachm (4 cc.), for the protection against rickets, and of this oil and a more concentrated preparation of vitamin D for infants with active rickets. In a series of controls under 12 months of age receiving no protective vitamin, two thirds developed rickets, whereas in a similar series between 1 and 2 years only 10.7 per cent developed the disorder. Control children over 2 years all remained free during the six months of observation. A daily dose of 1 drachm of cod liver oil (600 to 800 international units) failed to protect two thirds of infants under 6 months. Two drachms, or 1,500 international units, protected most and 3 drachms, or 2,100 international units, all infants under 1 year. About 11 per cent of infants between 1 and 2 years receiving 1,500 international units daily developed rickets, but all remained free on 3,000 international units. Infants under 1 year showing mildly active rickets were cured on 1,500 units of cod liver oil daily. Those between 1 and 3 years appeared to require doses up to 3,000 units. All infants showing severe rickets responded well to daily doses of 3,250 units in a concentrated preparation.

Paroxysmal Tachycardia in Infancy.—Leys presents the report of a girl baby who was hospitalized two months after birth because two days before she had been discovered in her cot looking "suffocated." She was red in the face, sweating and gasping for breath. After two hours she improved but later vomited her food. Subsequently she appeared to have spasms of pain and was restless all night and the following day; breathing was labored. The heart rate was found to be 240, with regular rhythm. The cardiogram showed auricular tachycardia. Chloral hydrate was given and, because an infection was suspected, sulfadiazine. The cardiac condition improved but signs of encephalopathy appeared and the child died. Lydia Fehily described a syndrome characterized by vomiting, abdominal pain, diarrhea, abdominal distention, stiffness of the neck and extremities and convulsions. She suggested that this syndrome is due to milk intoxication from mothers with beriberi. Leys has seen at least one attack of this kind in a breast fed infant. The resemblance between the two types of syndrome, (1) Fehily's infantile intoxication and (2) the syndrome of tachycardia with fever, leukocytosis and symptoms suggestive of encephalopathy, suggests a common cause, such as milk intoxication.

British Journal of Ophthalmology, London

29:221-276 (May) 1945

Ophthalmology in Lagos, 1943. R. Walkingshaw.—p. 221.
New Instrument for Dark Adaption Tests. W. Koch.—p. 234.
Trachoma in West African Negroes. J. G. Scott.—p. 244.
"Antiquity of Ophthalmology." W. B. I. Pollock.—p. 252.
Review of Eye Disease in Central Asia. G. H. Pearson.—p. 260.

British Journal of Urology, London

17:1-44 (March) 1945

*Cystometry. D. Band.—p. 1.

Cystometry.—Cystometry is a recent addition to methods of urologic examination. It implies a urologic examination of a spinal cord reflex. The bladder is a reflex organ, and the stimulus to contraction is the "stretch reflex" of the bladder musculature. A technic for cystometry has been devised whereby the "stretch reflex" of the bladder may be studied as a kymographic recording of the bladder contractions. The normal cystogram is described and a classification is suggested for the various types of neurogenic bladder. Typical cases of neurogenic bladder illustrate the conformity of the cystometric interpretations of the neurologic symptoms and signs.

British Medical Journal, London

1:581-616 (April 28) 1945

*Intravenous Arsenic in Treatment of Anginous Forms of Glandular Fever, with Notes on Clinical and Laboratory Diagnosis. K. Shirley Smith and T. H. Shaw.—p. 581.
*Potent Anti-Rh Agglutinins Developed in Rh Negative Female After Multiple Transfusions of Rh Positive Blood. R. Drummond, G. L. Taylor and J. T. R. Edwards.—p. 584.
The War Disabled: Their Emotional, Social, and Occupational Situation. E. Wittkower.—p. 587.
Oxaluria in British Troops in India. J. M. Black.—p. 590.
Intravenous Anesthesia with Pentothal Sodium. B. Solomons.—p. 592.
Treatment of Soft Warts with Podophyllin. J. V. Macgregor.—p. 593.

Intravenous Arsenic in Glandular Fever.—According to Smith and Shaw, throat lesions of the anginous type of glandular fever may be among the most severe that can be encountered. Not only may there be massive edema accompanying the acute inflammation of the tonsils and neighboring structures, but these may become extensively ulcerated; considerable bleeding may ensue. Bronchopneumonia may develop and bring about a fatal issue. The authors employed neoarsphenamine in the first case with the aim of countering a Vincent's infection which was believed to be complicating anginous glandular fever. The beneficial effect of the drug in this case prompted its use in cases 2 and 3 even though no Vincent's organisms had been found in the throats. In both rapid subjective and clinical improvement resulted, and similar results followed this therapy in the remaining cases. The immediate improvement in the local and general condition of the 6 cases and the subjective improvement indicate that the arsenical was beneficial. Neoarsphenamine was given intravenously in doses of from 0.15 to 0.45 Gm. Local treatment is also important in anginous forms of glandular fever. Scrupulous attention to cleansing of the throat, teeth and gums is the first essential. Swabbing with hydrogen peroxide was the most effective local treatment in the acute stage, while applications of hot absorbent cotton or of kaolin eased the pain in the neck. After the acute stage, and for residual ulceration of the tonsils, a paint made up of equal parts of liquor arsenicalis and tinctura ipecacuanhae was the most effective local application.

Development of Anti-Rh Agglutinins After Multiple Transfusions of Rh Positive Blood to Rh Negative Patient.—Drummond and his associates report results of multiple blood transfusions given a woman aged 47 with suspected thrombocytopenia. The Rh blood group was not ascertained. Five of the 6 donors used for the first three transfusions were Rh positive, while the Rh group of the sixth one was not known. The first diagnosis of Rh positivity was made on the third day after the third transfusion and was due to large numbers of surviving cells of the Rh + donors in the recipient's blood. The next three transfusions were not complicated by febrile reactions, although 2 at least of the 6 donors used were Rh + and no incompatibility was observed in the cross matching tests. The reaction complicating the third transfusion was possibly hemolytic in nature, since there was no subsequent rise of hemoglobin. Hemolytic reactions complicated the seventh, eighth, ninth and tenth transfusions. The significance of these reactions was not at first apparent. Only in retrospect did the position become clear. It was because of the reaction and the agglutination observed in the cross matching tests in the tenth transfusion, and the failure of the patient to improve despite transfusions, that further investigations were requested. Only when the Rh negative diagnosis was made and the anti-Rh agglutinin discovered in the recipient's serum was the history reviewed and the facts placed in their true perspective. This case illustrates the importance of (1) ascertaining the Rh group of a recipient as a preliminary when multiple blood transfusions are contemplated, (2) the possible danger of being misled when an Rh negative recipient's blood gives an Rh + reading after a blood transfusion and (3) never omitting cross matching tests.

Journal of Hygiene, London

44:67-148 (April) 1945

Studies of Infant Mortality: Part I. Influence of Social Conditions in County Boroughs of England and Wales. B. Woolf and J. Waterhouse.—p. 67.
Changes in Nuclear Structure of Bacteria Particularly During Spore Formation. Emmy Klieneberger-Nobel.—p. 99.
Effect of Temperature of Incubation on Results of Tests for Differentiating Species of Coliform Bacteria. C. B. Taylor.—p. 109.
New Non-Mannite Fermenting Dysentery Organisms of Flexner Group. F. M. Berger.—p. 116.
Outbreak of Water Borne Typhoid Investigated by Bacteriophage Typing and "Selective" Sewage Examination. P. G. H. Gell, Betty C. Hobbs and V. D. Allison.—p. 120.
Agglutination Tests in Diagnosis of Enteric Fever in the Inoculated. J. F. Wilson.—p. 129.
Practical Application of Immunologic Principles. Mollie Barr and A. T. Glenny.—p. 135.
Studies on Immunization by a Species Antigen: III. Presence of Anti-Immunity Factor in Pneumococcus. H. B. Day.—p. 143.

Medical Journal of Australia, Sydney

1:337-360 (April 7) 1945

Diarrheal Diseases in New Guinea. C. Fortune and A. A. Ferris.—p. 337.
Therapeutic Convulsions by Repeated Passage of Alternating Current, with Description of Apparatus Used. H. M. Southwood and W. Forte.—p. 344.
Intramuscular Administration of Penicillin: Method That Entails Only One Needle Insertion Daily. R. S. Lahz.—p. 347.

Proceedings of Royal Society of Medicine, London

38:237-308 (April) 1945

Diagnosis and Treatment of Male Infertility. K. M. Walker.—p. 243.
Experimental Fetal Death: Surviving Placenta. A. S. G. Huggett and J. J. Pritchard.—p. 261.
Blood Electrolytes in Clinical Medicine: President's Address. E. N. Allott.—p. 267.
Review of Surgical Treatment of Chronic Ulcerative Colitis. R. S. Corbett.—p. 277.

Medicina, Mexico

25:145-164 (May 10) 1945. **Partial Index**

*Arterial Hypertension: Modern Conceptions. E. Cruz Coke.—p. 154.

Arterial Hypertension.—Cruz Coke established in animal experiments that hypertensin (angiotonin) and hypophysin are destroyed in vitro by the addition of pure iodine. The addition of cytochrome oxidase to a mixture of isotonic solution of three chlorides and hypertensin nullified the hypertensive effect of hypertensin during perfusion, and intravenous or intraperitoneal injection of cytochrome oxidase to animals with experimental hypertension produced either normalization of arterial blood pressure or a decided lowering. The hypotensive effect lasted for more than sixteen hours. In normal animals the injection of cytochrome oxidase did not affect the blood pressure. The author concludes that arterial hypertension is due to diminished respiration of tissues, which in turn stimulates production of hypertensin and slows destruction of this substance. Hypertensin and hypophysin are both hypertensive substances which can be destroyed by oxidation. The treatment of hypertension aims to restrict rather than to prevent the formation of hypertensive substances. It consists in administration of cytochrome oxidase and of catalyzers of oxidation. Food rich in tyrosine and in proteins is prohibited.

Khirurgiya, Moscow

9:1-96, 1944. **Partial Index**

Modern Prosthesis. N. N. Priorov.—p. 3.
Pathology and Pathogenesis of Shock. N. A. Kraevskiy.—p. 7.
*Tissue Therapy of Indolent Wounds. G. A. Berdichevskiy.—p. 21.
Free Transplant of Full Thickness Graft. F. M. Khitrov.—p. 31.
*Extraperitoneal Lumbar Sympathectomy for Causalgia. P. S. Babitskiy.—p. 34.

Tissue Therapy of Indolent Wounds.—Berdichevskiy reports 150 observations in which tissue therapy was resorted to in order to stimulate the healing of indolent wounds. Both homoplastic and heteroplastic tissues were used. All of the tissues proved effective. That taken from a thyrotoxic thyroid and fat tissue appeared to provoke a greater reaction. The tissue is kept for use in 0.5 per cent solution of phenol. More recently the author resorted to placental and amniotic tissue. The tissue is applied directly to the wound without any particular treatment of the wound or the ulcer. In the treatment of trophic ulcers there were 25 per cent failures. The tissue applied to the wound does not suppurate; it undergoes lysis. The changes in the wound consist of rapid granulation and rapid epithelization.

Sympathectomy in Causalgia.—Babitskiy states that sympathectomy gives an early and permanent relief from causalgia. Causalgia of a lower extremity is best treated by the removal of the fourth, third and possibly second lumbar ganglions. Removal of the stellate ganglion and third dorsal is indicated in the causalgia of the upper extremity. In some cases more or less permanent relief was obtained by procaine hydrochloride blocking of the corresponding sympathetic ganglions.

Acta Chirurgica Scandinavica, Stockholm

90:179-274 (Aug.) 1944. **Partial Index**

*Urinary Lithiasis in Childhood: Clinical Study of 71 Cases. C. C. Winkel Smith.—p. 179.
Technic of Adrenalectomy for Genitoadrenal Syndrome During Childhood. E. Dahl-Iversen.—p. 210.
Thrombosis Following Leg Injuries. G. Bauer.—p. 229.
Delayed Choliangography and Treatment of Overlooked Stones by the Pribram Method. T. C. Gertz.—p. 249.

Urinary Lithiasis in Childhood.—The material presented by Winkel Smith comprises 71 cases of urinary calculi in children up to the age of 14. The ratio of boys to girls was 3 to 1. The duration of symptoms before the diagnosis indicates that two thirds presumably have had the stones before the age of 5. The greatest majority of these children had either renal or ureteral stones, only a few had vesical and urethral calculi. Spontaneous passage of stones was observed in 26 cases, and in 12 of these there was no recurrence. Fifty-three of the patients underwent 63 operations. Primary nephrectomy was done in 7 cases, simple lithotomy in 36, and 9 of the patients were subjected to several operations. There was one surgical fatality. The recurrence percentage was 29 in infected and 11 in aseptic cases. Urinary lithiasis in childhood is not as rare as is generally assumed in the Scandinavian countries. Surgical intervention is advisable irrespective of age, because considerable damage to the urinary tract is likely to result.

Nordisk Medicin, Stockholm

22:1203-1270 (June 30) 1944. **Partial Index**

Important Old Danish Clinical Reports. I. Matthia Saxtorph: Ischuria Due to Retroflexion of Uterus. S. A. Gammeltoft.—p. 1203.

Hospitalstidende

Investigations on Elimination of Alcohol Through Lungs. V. Eskelund.—p. 1205.
Intermittent Dropsy of Joints. B. Suryaninoff.—p. 1210.

Hygiea

Shelf Operation on Hip. G. Wiberg.—p. 1213.

Svenska läkaresällskapets förhandlingar

Fight Against Venereal Disease. R. Huss, E. Rietz, G. Willners and G. Hagerman.—p. 1217.
*Poliomyelitis Epidemiology in Light of Studies on Morbidity. G. Olin.—p. 1235.
*Pure Preparation of Different Poliomyelitis Viruses. S. Gard.—p. 1239.
Recovery in Larger Poliomyelitis Material. R. K. Bergman and S. Orell.—p. 1241.
Sex Education in Schools. C. W. Herlitz.—p. 1244.

Poliomyelitis Epidemiology.—Olin reports that in the 8,288 with paralysis of 9,992 poliomyelitis cases in Sweden from 1930 to 1939 the mortality was 15.6 per cent. The morbidity was about 25 per cent higher in men than in women. The greater morbidity in predominantly agricultural communities depends mainly on greater morbidity in the age groups over 10. Increased resistance is believed to depend on latent immunization, which affects different categories of population in varying degrees.

Pure Preparation of Poliomyelitis Viruses.—Gard describes the successful purification by salting out and differential centrifugation of murine and human virus proteins and isolation from human stools and the intestinal contents of mice of protein substances which are similar to the neurovirus protein. No essential differences between the neurovirus and the intestinal virus or between active and inactive material from the intestinal contents could be established in study of the morphology of the preparations by electron microscopy.

Book Notices

Food for the World. Edited by Theodore W. Schultz. Cloth. Price, $3.75. Pp. 353, with 8 illustrations. Chicago: University of Chicago Press; London: Cambridge University Press, 1945.

This book is not one person's views but a compilation of essays by twenty-two qualified authors followed by discussions. The material was presented at the twentieth institute of the Harris Foundation of the University of Chicago.

The six parts of the book are devoted to the food movement, population, nutrition, food supplies, international relations and consequences and policy. The arrangement is logical, and the general index is a further aid to the interested reader to find what he wants in this broad field. Even in countries that have an abundance of food, the diets of large sections of the population for the most part run counter to the knowledge and experience of present day advances in nutrition science and medical science. The war, with its extensive destruction of agricultural areas, farm equipment and transportation, and dislocation of millions of people made peacetime unsatisfactory conditions even worse.

As far back as 1930 the League of Nations through its Mixed Committee laid the foundation for the movement for better food and nutrition as a public health measure. The work of the league had not advanced far enough and had not received the encouragement it deserved when the present war broke out. The matter of food was again brought to the world's attention at the conference on food and agriculture at Hot Springs in 1943 and presumably will not be missing from the deliberations by a suitable section of the several councils provided by the charter of the recently held San Francisco United Nations Security Conference. Governmental and voluntary international and national organizations again face the challenge of feeding those in the world who are hungry and furnishing the whole world with the kind of food that has the essential nutrients.

Some of the essays review the ever growing concern with food and nutrition. They describe the advances made in these fields and their relationship to health. They point out the population problems, rises and declines as caused by mortality, fertility and other factors, and ratios of populations to land. Attention is called to the estimate that more than one half of the world's two billion people are underfed. The essays deal with food consumption levels as influenced by the income of the individual or family, by the price of food, by degree of popular knowledge as to intelligent selection of food and by the supply of food in places where it is needed. In several places reference is made to agricultural surpluses in the past in the United States and the measures of government aiming at their balance. The point is well made that even abundance of food supply is adequate only when it contains the essential nutrients, and this aspect is important to any intelligently conceived and soundly applied food program.

The discussion on the advances already made in nutrition research only strengthens the need for continuation and extension of investigational projects not alone with animals but also with human beings. The areas that especially require intensive study are the vitamins and minerals.

Total War and the Human Mind: A Psychologist's Experiences in Occupied Holland. By Major A. M. Meerloo, M.D., F.R.S.M. Cloth. Price, $1.75. Pp. 78. New York: International Universities Press, Inc., 1945.

The name of Major Meerloo is known to the medical profession as that of a competent psychologist and physician. He has written previously on such subjects as the psychology of pain and sorrow. For more than two years he lived under the German oppression. The story of life in Holland during those two years is a convincing personal narrative of that experience with the philosophical comment of a trained observer. He has analyzed Hitler's psychologic weapons and the morale that enabled the Dutch people to resist. A section on the psychology of radio propaganda should be studied by every one interested in the use of the radio as a tool for mass education. His prophylaxis for the next war bids fair to be realized in the new San Francisco charter. Coupled with such an international mechanism, he calls for active education in democracy.

Population Roads to Peace or War. By Guy Irving Burch, Director, Population Reference Bureau, and Elmer Pendell, Ph.D. Foreword and Postscript by Walter B. Pitkin, Ph.D. Paper. Price, $1. Pp. 138. Washington, D. C.: Population Reference Bureau, 1945.

The main thesis of this book is that the differential fertility and mortality throughout the world is a force of great weight in the determination of economic, political and international policy both in peace and in war. The facts on which the book is based are well known to students of demography and have been publicized more widely to the general public in recent years. The authors are well qualified by previous experience in the field. The book is written for the intelligent layman and could be readily understood by him. The increase of 50 million in the population of India between 1930 and 1940 is one of those facts. The book discusses widely held fallacies about population, including the role actual and potential of migrations, sterilization and marriage standards. The principal conclusion is that satisfactory standards of living in peacetime cannot be effected without population limitation and that unless such measures become more widespread, especially in certain critical areas of the world, all attempts at international organization to prevent war inevitably will fail. The population facts as given in the booklet are based on the best available information; the conclusions and recommendations represent opinions held by the authors and by many other well informed persons. Whether or not all of them will stand the test of critical evaluation and of time remains to be determined, but they deserve the attention of all thoughtful citizens.

Physical Growth from Birth to Two Years. I: Stature. A Review and Synthesis of North American Research for the Period 1850-1941 [including Appendix of 23 Tables]. By Howard V. Meredith, Ph.D., Robert R. Sears, Ph.D., editor, University of Iowa Studies, Studies in Child Welfare, Volume XIX, No. 407. Paper. Price, $1.50. Pp. 255. Iowa City: University of Iowa Press, 1943.

This monograph presents much accurate information scientifically gathered which should be interesting and informative to the pediatrician as well as to the research investigator. The many authoritative abstracts on the relation of diet, disease and various physical abnormalities to stature makes a valuable treatise. The extensive bibliography should be very useful to any one undertaking such studies in the future on the differences and the effects of illness and dietary treatment. Part II is an annotated bibliography of all studies published in North America to 1942 and gives data on stature during the first two years of life. It represents much more work than its size first suggests and would make a valuable reference work for any one interested in infant development.

National Health Agencies: A Survey with Especial Reference to Voluntary Associations. By Harold M. Cavins. Including a detailed directory of major health organizations. Cloth. Price, $3. Pp. 251. Washington, D. C.: Public Affairs Press, American Council on Public Affairs, 1945.

Here is a record of the various voluntary public health agencies in the United States with information concerning their histories, backgrounds and place in our social organization. The national society of medical origin in the United States with the longest continued existence is the American Psychiatric Association, organized in 1844; next is the American Medical Association in 1847. The three chapters on the basic characteristics, backgrounds and social awakening related to voluntary public health organizations are most interesting. The discussions are succinct and yet fully informative. The book constitutes one of the best references thus far available in the field it concerns.

Jurisprudence for Nurses: Legal Knowledge Bearing Upon Acts and Relationships Involved in the Practice of Nursing. By Carl Scheffel, Ph.B., M.D., LL.B., in collaboration with Eleanor McGarvah, R.N. Third edition. Cloth. Price, $3. Pp. 264. New York: Lakeside Publishing Company, 1945.

This is the third edition of a book originally published in 1931. It contains seven chapters dealing with the legal status of nurses, the legal obligation of nurses, nurses and contracts, nurses and wills, nurses as witnesses, criminal responsibility of nurses and property rights in clinical charts, case histories, roentgenograms, certain other records and pathologic specimens. A brief analysis of the nursing laws of the United States and Canada is included in an appendix.

Organic Chemistry. By Louis F. Fieser and Mary Fieser. Cloth. Price, $8. Pp. 1,091, with illustrations. Boston: D. C. Heath & Company, 1944.

This textbook of organic chemistry is one of the best such fundamental works of recent years and follows generally the traditional plan of organization. The book has special features in the addition of numerous optional chapters, written mostly by Mary Fieser, on applications of organic chemistry to technology and to the biologic and medical sciences, rendering the book particularly valuable to the physician. It thus affords the premedical student the chance to get a glimpse of the direct application of this phase of chemistry to his interests. A few of the supplementary topics are microbiologic processes, role of carbohydrate in biologic processes, metabolism of fats, proteins and amino acids and advances in chemotherapy. In view of the present day lack of good biologic chemistry textbooks, these sections are particularly valuable in presenting briefly current knowledge of certain phases of metabolism. The book is particularly well written and contains more than the usual number of structural formulas, structural equations and tables of constants of compounds. One criticism of the manuscript may be leveled at the incidental treatment of the heterocyclic compounds. However, extensive references at the end of each chapter and an adequate index complete an otherwise well rounded textbook.

Public Medical Care: Principles and Problems. By Franz Goldmann, M.D. Cloth. Price, $2.75. Pp. 226. New York: Columbia University Press, 1945.

The author discusses the development of hospitals, medical centers and plans for the care of the indigent. He considers finally programs of planning for expansion of medical institutions and services, inclining actually toward a complete system of state medicine but being willing apparently to concede that physicians are people. He states that there are three ways to solve the problem of medical care: (1) centralization of both power and function, (2) decentralization of both power and function and (3) centralization of power, complete or limited, along with decentralization of function or certain types of function. The approach of Dr. Goldmann, although he is a physician, is distinctly that of the economist and social worker. There seems to be nothing in his point of view which would mark it particularly as that of the man trained in the American tradition of democracy.

Personnel Work in Schools of Nursing. By Frances Oralind Triggs, Ph.D. Cloth. Price, $2.75. Pp. 237. Philadelphia & London: W. B. Saunders Company, 1945.

This has been prepared as a guide for the development of student personnel programs in schools of nursing education. Its primary purpose, therefore, is to instil in the prospective counselor, the teacher, the supervisor and other members of the administrative nursing staff a greater knowledge and understanding of the problems, technics and methods involved in the guidance and counseling of students in training. The book is divided into four parts, including a brief introductory review of the structural, physiologic and psychologic bases of human behavior, learning and adjustment. The remaining sections are devoted to the counseling program itself, which the author has handled with expert knowledge. Part II describes the essential qualifications of counselors, individual technics and many of the nursing problems that are commonly encountered in educational, personal and vocational counseling. In part III the reader becomes familiar with the various methods employed in the selection of students as well as the interpretation and evaluation of individual tests. By presenting a complete case record in part IV the author has successfully illustrated many of the principles and technical details involved in the counseling process. An extensive bibliography provides ready access to other valuable references in this field.

LeRoy Long: Teacher of Medicine. By Basil A. Hayes. Fabrikoid. Price, $1.50. Pp. 91, with 4 illustrations. Oklahoma City: The Author, 1943.

This work includes a series of articles previously published in the *Journal of the Oklahoma Historical Society*. It traces the life of a medical pioneer of our own times who fought for high standards of medical care and who contributed greatly to the advancement of medicine and medical education in Oklahoma.

The Basis of Clinical Neurology: The Anatomy and Physiology of the Nervous System in Their Application to Clinical Neurology. By Samuel Brock, M.D., Professor of Neurology, College of Medicine, New York University, New York. Second edition. Cloth. Price, $5.50. Pp. 393, with 72 illustrations. Baltimore: Williams & Wilkins Company, 1945.

This has proved its value and established its position in American neurologic literature since it first appeared in 1937. This work correlates the facts of neuroanatomy and neurophysiology with the clinical manifestations of neurologic disease in a useful fashion. It bridges the gap between laboratory studies and the bedside for both student and practitioner. In the new edition the author has surveyed and analyzed the literature and has brought to his readers in a clear and concise fashion the recent advances in fundamental science. There are but few statements to which exception can be taken. The book can be recommended to all who wish to bring themselves up to date on important matters of neuroanatomy and neurophysiology and their relation to the behavior of the human nervous system in both health and disease.

The American Year Book: A Record of Events and Progress, Year 1944. Edited by William M. Schuyler with the cooperation of a supervisory board representing national learned societies. Cloth. Price, $12. Pp. 1,082. New York: Thomas Nelson & Sons, 1945.

This book presents a survey of the year 1944 in twenty-seven major fields of activity, among them the medical sciences. The reviews of medicine, pathology and physiology are prepared by Dr. Max Trubek of New York, who tells of the advances with penicillin, the control of typhus, the insect repellents, thiouracil and blood fractions. The article on surgery is by Dr. Edwin J. Pulaski of New York. He discusses the sulfonamides, penicillin, proteins, thiouracil, frostbite and blood fractions. The article on public health is by W. W. Peter of New Haven, Conn. He discusses the health of the nation from many different points of view and seems to have reviewed adequately major fields of interest in public health in recent years.

François Magendie: Pioneer in Experimental Physiology and Scientific Medicine in XIX Century France. By J. M. D. Olmsted, Professor of Physiology, University of California, Berkeley, California. With a preface by John F. Fulton. Cloth. Price, $5. Pp. 290, with 5 illustrations. New York: Schuman's, 1944.

This is a clearly written factual account of a great pioneer in the medical sciences of France a hundred years ago. The first part of the last century was a great period for medical science in that country, with such leaders as Lavoisier, Magendie and Magendie's pupil Claude Bernard. It is worth while for members of our profession to secure inspiration, guidance and courage from the great medical leaders of the past, men who frequently labored under great difficulties and yet carried the torch forward. Professor Olmsted has rendered medicine a distinct service in presenting this clear story of François Magendie.

The Autobiography of Science. Edited by Forest Ray Moulton and Justus J. Schifferes. Cloth. Price, $4. Pp. 666. Garden City, N. Y.: Doubleday, Doran and Company, Inc., 1945.

For every physician this anthology will be an interesting and useful work. Here are quotations from most of the important scientific works known to mankind, with brief introductory biographic statements and with interpretative paragraphs that add to their value. The work begins with the story of creation from Genesis and carries us along through the Smith Papyrus and the works of Hippocrates to Sigmund Freud, William Osler, Walter Cannon and Harvey Cushing.

Taber's Dictionary of Gynecology and Obstetrics. By Clarence Wilbur Taber. With the collaboration of Mario A. Castallo, M.D., F.A.C.S., Assistant Professor of Obstetrics, Jefferson Medical College, Philadelphia. Cloth. Price, $3.50. Various pagination, with illustrations. Philadelphia: F. A. Davis Company, 1944.

The authors in their foreword say that this is a specialized medical dictionary designed for all those interested in obstetrics and gynecology, the nurse, student, practitioner and specialist. In addition to the usual definitions, many subjects are treated in considerable detail with the aid of outlines and illustrations. Some data, such as an outline of infectious diseases in children, are not quite pertinent to the subject. Some common terms are absent. Ergot is defined, but ergonovine is missing. This small book may be a useful reference book, but it does not replace the standard medical dictionaries.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ENDOCRINES FOR HYPOGONADISM AND THE MALE CLIMACTERIC

To the Editor:—**What is the danger, if any, of effecting testicular atrophy or germinal cell depression with the use of testosterone (testosterone propionate and methyl testosterone) or pituitary gonadotropin in such conditions as hypogonadism, cryptorchism and the male climacteric? Are such changes, if any, irreversible? Are there any other possible contraindications? Of the two substances testosterone and gonadotropin, which is preferable in the treatment of the conditions mentioned?**

M.D., California.

ANSWER.—In a man with a normal spermatozoa count the administration of testosterone propionate in a dose of 25 mg. a day may produce azoospermia. Recovery takes place within two to three weeks after discontinuing treatment, and there are apparently no ill effects. It is not known definitely whether methyl testosterone will produce the same effect or not. Azoospermia also has been produced in a few instances by the administration of pituitary gonadotropin. The best general rule to follow in the treatment of hypogonadism is to use stimulation therapy first and to resort to substitution therapy with male sex hormone if it fails. Commercial preparations of pituitary gonadotropin are of little value in men. They sometimes produce menstruation in women with secondary amenorrhea. Chorionic gonadotropin is effective in men. It stimulates the interstitial cells of the testis to produce male sex hormone but has little or no influence on spermatogenesis. It is primarily of value in the treatment of cryptorchism and hypogonadism secondary to hypopituitarism. It is also of value in the Froehlich syndrome. Testosterone propionate is more effective in the male climacteric.

SCLERODERMA AND ULCERATION OF LEGS

To the Editor:—**For about two years I have been treating a woman aged 58 for scleroderma with deep ulcerations of both legs. I have used thyroid and mild ointments. The ulcers have healed except for two spots and superficial skin lesions. Would it be advisable to try penicillin?**

Theodore Bilski, M.D., Westfield, Mass.

ANSWER.—Ulcers seldom form at sclerodermatous sites, except at bony prominences or where there is extrusion of associated calcium deposits. Scleroderma of the legs usually develops a hidebound condition, which over the legs is severe. If the lesions really were sclerodermatous, it is probable that they were of the morphea variety. This is so because the latter finally develops a thin atrophy and in this patient the remaining lesions are superficial. Several conditions on the legs may stimulate scleroderma or localize scleroderma. Necrobiosis lipoidica diabeticorum may or may not ulcerate. A dermatitis on the legs due to insufficiency in the circulation may sometimes be quite indurated and thickened to simulate scleroderma. Such a stasis dermatitis could develop ulcers. It is possible that this is the case here. If this is so, the poor blood circulation would need alleviation or correction. Antibiotics such as tyrothricin, together with other appropriate measures, have been found useful for these ulcers. Penicillin also, used locally, probably would be helpful.

GEOGRAPHY OF UPPER RESPIRATORY INFECTIONS

To the Editor:—**Will you kindly give me the names of states which show the lowest incidence of upper respiratory infections and sinusitis, also the states which show the highest rates for these two diseases?**

R. Thornell Mauer, M.D., Omaha.

ANSWER.—Since the diseases mentioned are not reportable and seldom appear as causes of death, there are no actual statistics on their prevalence in different regions. They seem related more to weather instability (storminess) rather than to any other environmental factor and hence are at a minimum in the Southwest (New Mexico, Arizona and southern California, except along the immediate coastal fringe of 20 miles or so). They are most prevalent in the Missouri, upper Mississippi and Ohio river basins and eastward to the Atlantic coast. Urban atmospheres polluted with domestic flue and industrial wastes greatly intensify the respiratory disease problem.

CHEMISTRY OF DIGESTION

To the Editor:—**How many carbon atoms do the breakdown products of carbohydrates, fats and proteins have at the time they are absorbed through the walls of the digestive system? Naturally the compounds at that stage have various molecular sizes. What is the maximum size which can pass into the body in ordinary procedure?** **M.D., New York.**

ANSWER.—Carbohydrates are absorbed from the digestive tract mainly as hexoses, 6 carbon chains; fats are thought to pass into the lymph and then into the blood as resynthesized fats with the intermediate hydrolysis to glycerol and fatty acids, the latter mainly as 16 and 18 carbon chains. Normally the proteins are hydrolyzed in the digestive tract in the main to the amino acid stage and these absorbed into the blood stream. Such amino acids vary in size from 2 carbon to 11 carbon compounds. To some extent peptides, peptones or proteoses may be absorbed, but these forms are not now considered important or high in amounts in the normal absorption of proteins from the digestive tract.

MALARIA IN PREGNANCY

To the Editor:—**A woman who is about six months pregnant has malaria. Would it be safe to give quinine sulfate? If so, what dosage? What drugs could be safe for the treatment of malaria in this case?**

M.D., New Mexico.

ANSWER.—Although there is considerable doubt whether the therapeutic dose of quinine is sufficient to cause a premature delivery in a six months pregnant subject, a safer drug would be atabrine. The dose of the drug is 0.2 Gm. every six hours for the first day and then 0.1 Gm. three times a day for the five ensuing days.

PIGMENTATION OF SKIN DUE TO SYNTHETIC RUBBER

To the Editor:—**A housewife developed a severe dermatitis of her hands following the use of gloves made of synthetic rubber for the purpose of dishwashing. The dermatitis continued despite treatment until the use of the gloves was discontinued. The dermatitis then gradually disappeared but left a pigmentation of the skin around the wrists where the open end of the gloves came in contact with the skin. This pigmentation, apparently in the lowest layer of the skin, is disfiguring and annoying to the patient, as it looks like dirt on the wrists. It has persisted for three months. How can this pigmentation be removed?**

W. E. Lowthian, M.D., Baltimore.

ANSWER.—The treatment of hyperpigmentation is notoriously unsuccessful. In time it should disappear. The drug most commonly used for pigment removal is mercury bichloride. The following formula recommended by Von Harlingen may prove of value: mercury bichloride 0.4 Gm., zinc sulfate 2 Gm., lead acetate 2 Gm. and distilled water to make 120 cc.; this should be applied as a lotion morning and evening.

SÄNGER MODIFICATION OF CESAREAN SECTION

To the Editor:—**Please describe the Sänger modification of cesarean section.**

M.D., Arizona.

ANSWER.—Sänger introduced his modification of the cesarean operation in 1882. De Lee states that the following were the essentials of the operation:

"Median abdominal incision; median uterine incision, with or without eventration of the uterus; use of rubber ligature around cervix to stop hemorrhage; resection of a strip of uterine muscle under the peritoneum; eight or ten interrupted silver wire seromuscular sutures, avoiding the decidua; twenty to twenty-five interrupted fine silk seroserous (Lembert) sutures; extreme antisepsis."

These safeguards lessened the mortality rate of the operation in those days, but obviously they are not applicable at the present time.

WIRING IN FRACTURES OF THE JAW

To the Editor:—**Referring to the answer to the query on "Wiring in Fractures of Jaw" on page 774 of The Journal, July 7, 1945, "T. L. Gilmore" should read instead "T. L. Gilmer." Dr. Gilmer began the practice of dentistry in Quincy, Ill., later moving to Chicago, and for years he was connected with the Northwestern University Dental School, where he became famed in the field of oral surgery. The component of the Illinois State Dental Society in which Quincy is located was named "The T. L. Gilmer Component" in his honor.** **Hugh M. Tarpley, D.D.S., Quincy, Ill.**